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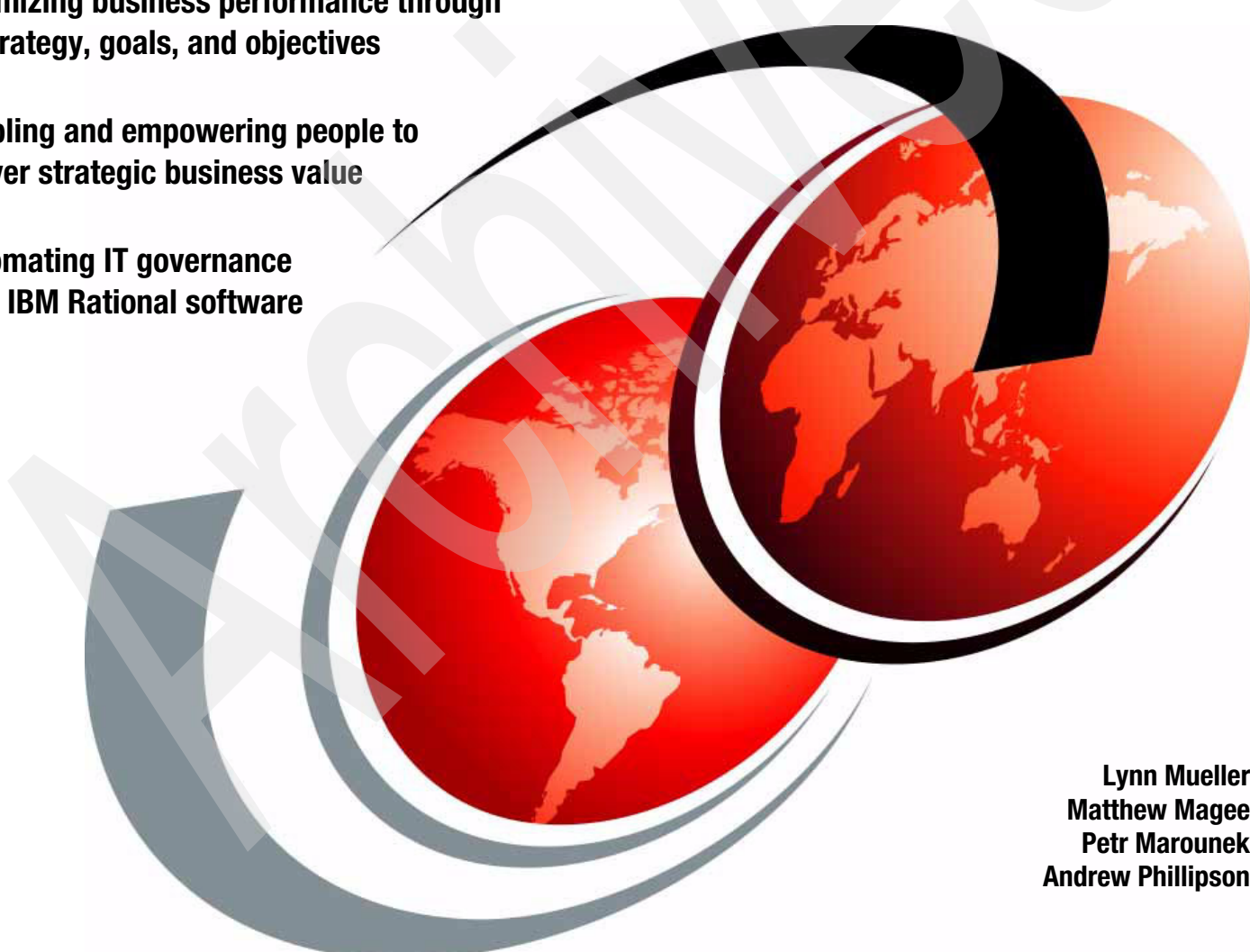# IBM IT Governance Approach
Business Performance through IT Execution

Optimizing business performance through IT strategy, goals, and objectives

Enabling and empowering people to deliver strategic business value

Automating IT governance with IBM Rational software

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IBM IT Governance Approach: Business Performance through IT Execution

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This edition applies to those listed in the following table.

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Preface

Information technology (IT) governance has assumed a prevalent spot in technical and management publications. When academics and practitioners alike pose such questions as "Does IT matter?", those of us in the IT field cannot help but to sit up and take notice.[1] We must manage with a focus on the following objectives:

► Articulating the value of IT investments so that the CEO understands what a dollar spent on technology yields in real earnings impact

► Helping the CIO feel comfortable with balanced risk exposure

The development of a management system that ensures IT can consistently deliver on these objectives is what IT governance is all about.

When the term *IT governance* is bantered about, the first word that usually comes to mind is *control*. Depending on who you are talking to, the reaction to that word varies greatly. The project manager who is tasked with delivering a new system might see control as an intrusion that takes away the ability to react. The executive might see it as a necessity to keep data secure and ensure that projects do not derail each other. Striking the right balance is not a simple task. Finding the situations in the organization to apply control, and to relax it, is the difference between excellent performance and mediocre results. The key to this flexibility is rapid feedback and visibility into IT operations.

At the time of this writing, the global financial markets are struggling to value the mortgage-backed securities that are held at various financial institutions. Balance sheet write downs total in the billions and have resulted in the firing of several high profile CEOs. This problem, which is dubbed the "sub-prime credit crisis," has lessons in a discussion of IT governance. Several large firms were able to avoid financial calamity through superb visibility into swirling business conditions in the credit market. They were able to see warning signs, in massive amounts of data, that their competitors did not see.

IT projects also have warning signs and patterns of failure that most organizations miss because they do not have the ability to make sense of the data. These warnings are buried not just in project plans, budgets, and demand plans, but more importantly in the myriad of day-to-day interactions and exchanges between clients, managers, developers, operations teams, and everyone involved in the process of delivering IT. Here is where the real risks lie. The key to effective governance is defining a system to tap into that data and put it into the hands of the people who can most effectively make decisions based on it.

Like the financial institutions mentioned previously, the most effective way to deal with the complexity facing IT is to build the flexibility to respond into your management system. By using software to collect the multitude of IT-related answers to decisions that are made each day, the IT industry has an opportunity to build the same competency in making sense of seemingly random events. Integrated development and service management tools are the data collection platform that make this opportunity possible. Access to this information ultimately gives executives the comfort to distribute decisions further into the organization and comfort in knowing that controls are in place to mitigate the biggest risks.

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[1] Carr, Nicholas G. "IT Doesn't Matter," *Harvard Business Review.* May 2003.

In this IBM® Redbooks® publication, we provide guidance in building this type of solution. We explore the following key concepts that underpin the successful development of your IT governance solution:

► The yield of more effective results with the right amount of flexibility
► Approaches to measuring the value of the contribution of IT to the business
► The linkage between systematic reduction of variance in reducing project risk
► The role of automation in providing executives the information that is necessary to adjust to changes on projects

All of these lessons are codified in an approach, called the *IBM IT Governance Approach*, that you instantiate within your organization. Applying this approach with the guiding principles and automating it with technology yield a governance solution that is adopted and viewed as an enabler to your teams. Most importantly it ensures that IT delivers its mission to add measurable business value and reduce risk to the business.

Clay Nelson
Business Unit Executive - East Region Technical Sales
IBM Rational® Software

The team that wrote this book

This book was produced by a team of specialists from around the world working at the International Technical Support Organization (ITSO) in San Jose, California.

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1

An introduction to governance

"Knowledge will forever govern ignorance; and a people who mean to be their own governors must arm themselves with the power which knowledge gives."

— *James Madison*

In this chapter, we introduce the concept of governance in the context of today's marketplace. We begin by discussing the risks and challenges that impact businesses today. We provide the definitions for, and a high-level overview of, the various types of governance. In addition, we introduce the advantages that governance and in particular information technology (IT) governance can provide to an organization or enterprise.

1

1.1 Challenges for business and IT

In today's business environment with its complexity, required quick responses, and globalization, the costs to an organization or enterprise can be significant to stay competitive and meet business initiatives and challenges, not to mention address risks. An enterprise might encounter some of the following challenges and business problems:

► Global competition
► Product development costs
► Regulatory compliance
► Lack of skilled staff
► New business opportunity

While addressing any or all of these areas, the enterprise must be certain that the value of the business internally and the value provided to its customers are maintained or improved. This causes executives to focus on how they structure, sustain, grow, transform, and manage the enterprise to meet these challenges including the corporate policies, processes, and IT infrastructure and systems that are required.

Often these challenges and business problems are converted to *risks*, which are then monitored and managed by the enterprise. The concept of risk is intuitive to all of us. A simple definition of *risk* is whatever may stand in your way or the enterprise's way of achieving success or milestones. Risk management is the process that is concerned with identifying, analyzing, and responding to risk. It includes the following activities:

► *Risk identification* to determine and document risks

► *Risk quantification* to evaluate risks to assess how to address

► *Risk response* to identify an approach for addressing threats or risks with possible strategies including avoidance, reduction, transference or retention

► *Risk control* to monitor risk and respond to any changes during the life of the risk

Every enterprise needs to establish a base for their operations. This base includes key business processes that are followed by all business units and supported by IT systems and infrastructure.

The ability to manage risk provides added value to the enterprise. A risk management process is one of the key business processes that every enterprise requires to conduct business in today's marketplace. Governance is another one of these key business processes and is the focus of this book. Governance processes provide enabling forces for the strategic alignment of business and IT as illustrated in Figure 1-1 on page 3. The concept of strategic alignment between the business and IT is also discussed in the article "Strategic alignment: Leveraging information technology for transforming organizations," by J. C. Henderson and N. Venkatraman, on the Web at the following address:

http://www.research.ibm.com/journal/sj/382/henderson.pdf

Other key business processes depend on the specific operating model that is selected by the enterprise as described in *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution.*[1]

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[1] Robertson, David C., Jeanne W. Ross, and Peter Weill. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution.* Harvard Business School Publishing, 2006.
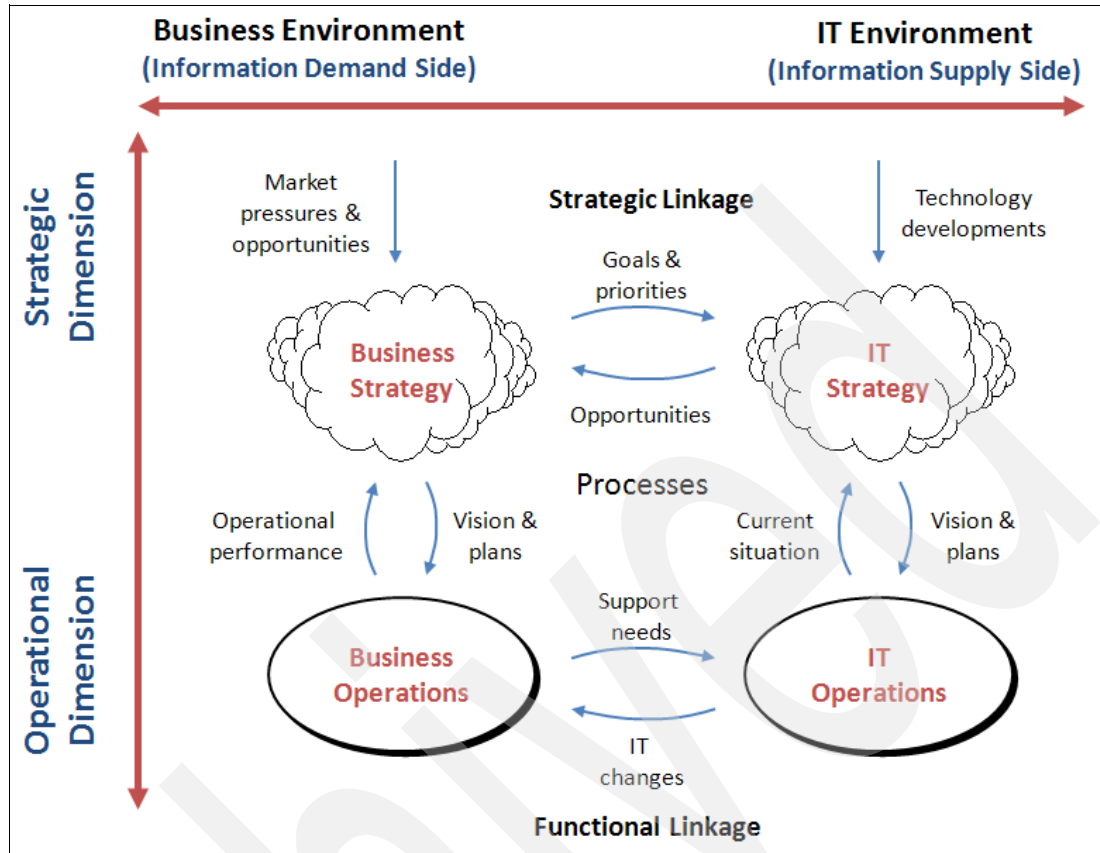
Figure 1-1   Business and IT alignment

1.2 What is governance

Before we begin to discuss governance and its relevance to an enterprise, we must put the term in context by defining it. One informal definition of the verb *govern* is to enact and control the policies and standards of a group, organization, or country. Since there currently is not one agreed upon definition for governance, we define and build upon an operational view and definition of the term. We define *governance* as a process, which is "a series of actions, changes, or functions bringing about a result."[2] Therefore, governance is the process of establishing:

► Chains of responsibility, authority, and communication (decision rights)

► Measurement, policy, standards, and control mechanisms to enable people to carry out their roles and responsibilities[3]

The first part of this definition provides a static view of governance. It defines the structure of the enterprise, how it functions, and its roles and responsibilities for each member of the enterprise. Specification of the flow of decision rights is most often stated in a *Responsible Accountable Consulted Informed (RACI) matrix*, which is one of the artifacts of a governance solution.

The second part of the definition provides a dynamic view of governance, which we can think of in terms of business performance. The enterprise defines and institutes corporate policies,

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[2] *The American Heritage College Dictionary, Fourth Edition*. Houghton Mifflin Company, 2007.
[3] Cantor, Murray and John D. Sanders. "Operational IT Governance." *The Rational Edge*. IBM Corporation, 2007.

identifying the standards that they will follow and specifying a set of measures and controls. In turn, these policies are enforced by their (business) processes. Artifacts that are produced to define the dynamic view of governance include a policies library and governance effectiveness measures.

1.2.1 Governance versus management

Many people believe that governance and management are synonymous, but they are not. Governance is about decision making, while management is about making sure that the enterprise's governance process is executed. In order to frame our perspective on IT governance, there is a distinction between those processes that are used to define a new process and those processes that are used to produce products, goods, and services from a given business entity.

A *governance process*, as described earlier, is used to define the chains of responsibility, authority, and communication to empower people, as well as to define the measurement and control mechanisms to enable people to carry out their roles and responsibilities. Thus, a governance activity is intentionally designed to define organizational structures, decision rights, workflow, and authorization points to create a target workflow that optimally uses a business entity's resources in alignment with the goals and objectives of the business.

A *management process* is the output from the governance process. Unlike a governance process, a management process implements the specific chain of responsibility, authority, and communication that empowers people to do their day-to-day jobs. The management process also implements appropriate measurement and control mechanisms that enable practitioners the freedom to carry out their roles and responsibilities without undo interruption by the executive team. These measurement and control mechanisms allow the executive team the ability to monitor the execution of both the governance and management processes remotely, as well as monitor the output quality of the management process in execution.

Although subtle, the distinction between these two processes is important to retain. An awareness of this distinction should allow you to identify where these two dissimilar functions exist within your own businesses.

Figure 1-2 illustrates the relationship between governance and management.[4]
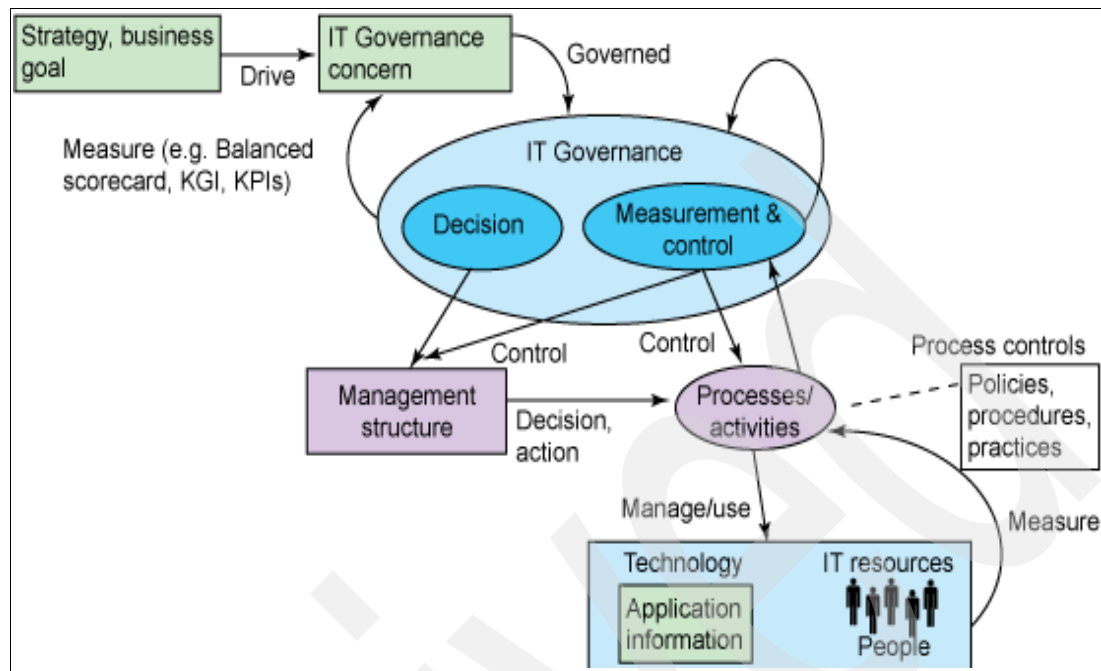
Figure 1-2   The relationship between governance, management, and business concerns

1.3 Governance objectives

There are numerous reasons for drawing such a distinction between the governance and management process layers. To begin with, governance processes ensure that the strategic initiatives of a given company are carried out appropriately. It also ensures appropriate oversight of the strategic initiatives that are currently planned or underway. Governance also ensures that these goals are met prudently and efficiently by using the optimal number of business resources that are available.

However, as the old saying goes, "Entropy needs no maintenance." Any system that is left unchecked will eventually degrade into an ineffective system. It is like running your automobile for 100,000 miles and never changing the oil or putting in new oil. Eventually, the engine will fail, and the motor will cease to function, even though it was running in top condition when you purchased it.

To ensure your management processes continue to operate efficiently, you must continually monitor its operation and conduct periodic maintenance or revisit its design. If you consider your business to be a high performance machine, you might have a greater need than most for good governance.

High performance equipment is tuned to run as close to the maximum mechanical tolerances as possible. In these situations, numerous gauges are required to ensure the engine does not self destruct as a result of intense pressures created by running at this pace for long periods of time. Executives understand that human capital works in much the same way. Such is the case with a high performance business as well. Running the organization at full capacity all the time will lead to loss of morale and will eventually lead to the loss of its key contributors.

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[4] Ibid.

High performance businesses require appropriate gauges. The gauges used in business provide important process conformance and product quality data.

For example, high manufacturing throughput ensures solid time to market. However, if product quality is not within acceptable tolerances, the data displayed on the gauges helps executives to know when they should slow down production. They then preserve current levels of customer satisfaction, presumably high customer satisfaction, until new, better or stronger resources can be supported.

Like automotive gauges for oil pressure and temperature, executives depend on gauges that reflect the key performance indicators (KPIs) and key goal indicators (KGIs) of the business. Depending on the domain of the business, regulatory concerns or financial risks must be accounted for. If the business operates in the pharmaceutical or medical device industry, a quality problem with prescription drugs or other medical equipment could put a manufacturer out of business or irreparably damage their reputation.

The objectives of *good governance* is to ensure that the strategic goals of the business are satisfied efficiently via a strong measurement mechanism that also supports a compliance management function. Integrating the four objectives of strategic goal satisfaction, efficiency, reliable and objective measurement, and compliance management is at the heart of the Rational governance capability that is presented in this book.

1.4 A sample governance landscape

Many perspectives of governance exist in an enterprise. We focus on those perspectives that are most relevant from a development point of view:

► Enterprise

Enterprise governance is at the highest level and drives and sets the goals that must be accomplished by IT governance.

► Information technology

IT governance is a subset of enterprise governance and encompasses systems, infrastructure, and communication.

► Product development

Product development governance, like IT governance, is a subset of enterprise governance and overlaps with it, given all their commonalities. It is targeted for enterprises that develop products.

► Development

Development governance is governance applied to development organizations and programs. It is a subset of IT and product development governance.

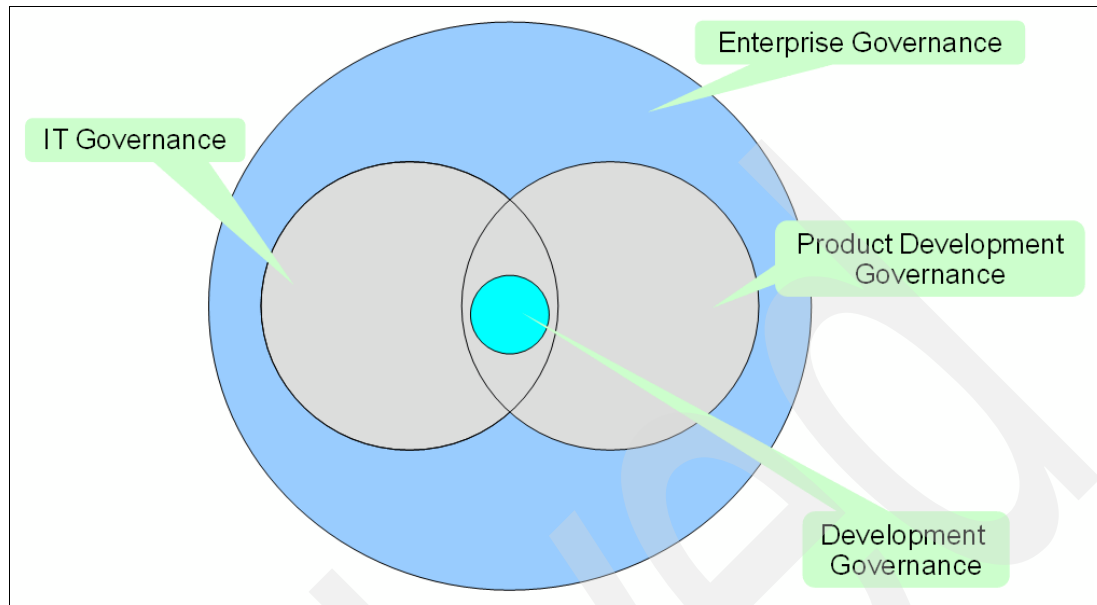Figure 1-3 illustrates the types of governance and their relationships.

Figure 1-3   Types of governance relationships

Organizations decide to introduce governance into their organization or to improve their existing governance processes and practices for many reasons. As mentioned in article "The governance landscape: Steering and measuring development organizations to align with business strategy," some reasons that IBM and IBM Rational frequently support are efforts to build a service-oriented architecture (SOA), IT support for compliance or geographically distributed development, as well as governance support.[5] Governance also is an integral part of development organization transformations that organizations may undertake to improve their practices and processes to become more efficient. In the following sections, we briefly describe each type of governance.

SOA governance

SOA governance is an augmentation of IT governance and focuses on the governance of services within a life-cycle context. SOA governance often drives changes to other domains of governance, such as corporate governance, as businesses re-examine their existing governance processes to make them more efficient and agile based on SOA architectural constructs.

Governance for compliance

Governance for compliance is an extension of enterprise governance. Compliance involves documenting and proving that governance measures are executed to reinforce a particular regulatory framework or standard. It ensures that decision rights related to the framework or standard are documented and followed.

Governance of geographically distributed development

In our globalized business environment, companies want the ability to develop and deliver software anywhere, anytime, by using the best resources regardless of where they are geographically located. You may also hear other terms used to describe this approach including outsourcing, offshoring, or right-sourcing. To make this work, companies need a

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[5] Ericsson, Maria. "The governance landscape: Steering and measuring development organizations to align with business strategy." *The Rational Edge*. IBM Corporation, February 15, 2007.

development environment that supports collaboration across "barriers", such as time zones, cultures, and so on, along with well-defined and agreed upon development practices. Governance relative to the distributed development should focus on the clarification of responsibilities and asset ownership, as well as on measures and control levels among the constituents.

Governance of development organization transformation

Enterprises often seek to transform the internal view or perception of the development organization or even the larger IT organization from cost centers to business value generators. This effort is focused on introducing best practices and tools, as well as changing behaviors, attitudes and culture. Good governance principles are needed to oversee these organizational change efforts to ensure that they achieve their expected results over time. IBM Rational has an approach that they have used for development organization and IT organization transformations called *Development Organization Transformation (DOT)*. For more information about DOT, refer to the white paper *Transforming your software development capabilities: A framework for organization*, by Zoe Eason, Maria Ericsson, and Lynn M. Mueller, on the Web at the following address:

http://www.ibm.com/developerworks/rational/library/sep05/eason/

1.5 The emerging IT governance approach

At its heart, governance is all about leadership. IT governance is about the way in which leadership accomplishes the delivery of important business capability using IT strategy, goals and objectives. IT governance is concerned with strategic alignment between the goals and objectives of the business and the utilization of its IT resources to effectively achieve the desired results.

IT governance is about disseminating authority to the various layers in the organizational structures within your business, while ensuring appropriate and prudent use of that authority. Although we normally organize ourselves into hierarchical structures, experience has taught us that network structures allow for specialization, teaming and building infrastructure to support those teams. Specialization allows the sum of the parts of the organization to be greater than the whole.

However, structuring ourselves into networks is counter-intuitive, and assembly of teams and sub-teams can often be a daunting task. Furthermore, experience has taught us that, as teams grow in size and as the mission of the organization grows larger and more complex, the ability of individuals to communicate effectively and share a consistent vision decreases significantly.

The following commonly agreed formula is used to describe the amount of direct and cross channel communications between team members on a project, where "N" is the number of team members:

```
[N x (N-1)]/2 = The number of necessary communications channels
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The result of this formula means that the addition of each new individual to a given project increases the potential communications traffic exponentially.

Consequently, the need to implement a deliberate approach for the assembly of well governed structures, processes, and tools requires deliberate planning, tactics, and methods. Therefore, governance is a process for the assembly of organizational structures, workflows, authorization points and dissemination of decision rights for the purpose of integrating the multifaceted agendas of organizations.

This is not to say that governance is only for large organizations. Small organizations have a need for good governance as well. However, obviously a smaller number of control points are deployed in a smaller operation.

Many people who are relatively skeptical toward this "new" governance approach do not understand that governance occurs either organically or deliberately. Smaller organizations are more likely to have organic governance structures. Others believe that the choice is "governance" or "no governance". The reality is that they are making a choice between "good governance" and "bad governance."

1.5.1 Organic and deliberate governance

As many venture capitalist know, the person who starts a company is not always the best person to take a company public. The operational characteristics that made a small company successful may not necessarily be the same capabilities that are required to make a scalable operation with several hundred or several thousand employees.

Small companies have the tendency to grow their governance functions based upon the need to address problems or anticipated near-term pitfalls. The development of these types of governance structures is a reaction to the demands placed upon the organization. Consequently, we refer to these governance processes as *organic governance processes*. Although these processes may are deliberately designed to address a specific problem, they are not likely to be deliberately designed to integrate with all of the other functions found throughout the business.

Another characteristic of organic governance is the typical absence of any reporting function that is tied to the established governance structure. Rarely are reactive mode structures erected with an associated measurement program or measurement plan. Consequently, rarely any controls are deliberately designed to monitor and analyze improvements that are tied to the goals and objectives of the business.

Organizations that operate on a large scale tend to require business operations that include more ceremony and many more checks and balances in order to protect the interests of the various stakeholders in the business.

Deliberate IT governance is the conscious application of systems theory to both the business as well the IT infrastructure that supports the business. The goal is to assemble a system of systems that is intentionally designed to optimize the capabilities of every function within the business. This occurs all while ensuring that the strategic goals and objectives of the business are being carried out.

1.5.2 The need for change

The need for change and the growing marketplace interest in IT governance is the result of a number of social, political, and market-driven events that have resulted in an increased awareness of corporate and personal risk by executives. The following events are among the most influential ones:

► The 1987 US Stock Market crunch[6]
► The September 11, 2001 terrorist attack on the World Trade Center in New York City
► The Sarbanes-Oxley (SOX) Act
  – The Enron scandal including the involvement of Anderson Consulting Services
  – The Global Crossing scandal

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[6] "Black Monday: the Stock Market Crash of 1987," by Stock Market Crash, 2006:
http://www.stock-market-crash.net/1987.htm

In each of these cases, we found a linkage between corporate accountability (or a lack thereof), market valuation and forces, and subsequent scandal or retribution. We also found new legislation or new controls that were put in place by a governing body or bodies to ensure that such an event would not occur again. This trend has been replaced by acts of "self governance" to prevent the types of exposure seen in the past.

For example, in 1987, junk bond trading and merger mania lead to an extremely negative biased futures market. At the time, most corporations financed corporate mergers through the sale of junk bonds or high interest loans against future profits. Futures traders began purchasing "short options" en mass, which forecasted the expected losses of these massively overleveraged companies. The end result was the start of a massive downhill run in most trading prices, which was exacerbated by an influx of sell requests by stockholders hoping to retain some portion of their stock equity. Since the market was unprepared to deal with the incredible number of sell requests, prices plummeted uncontrollably until 20% of the total market value of the DOW had been decimated.

Subsequently, the exchanges put in place "circuit breakers" against such trading volume in order to stave off the kind of run experienced in 1987. As a result, executives have come to realize there is a degree of personal accountability that business stakeholders have come to expect from them and the company they operate.

More recently, the Sarbanes-Oxley Act was developed in response to corporate scandals resulting from market forces. Shortly after the attacks of September 11, 2001, the market responded in a negative manner as expected. Although the market reaction was anticipated, the attacks clearly were not. Due to the dramatic fall in prices on an already overvalued market, financial exposure ensued.

Some companies that might have otherwise survived resolved to air their dirty accounting practices to explain the absence of real profit and real value. Many of these "Dot Com" Internet companies had measured success by the number of users looking at their Web sites and had not realized the losses they were accruing. Their ability to operate was based primarily on venture capital. When stockholders realized this, many began to sell their shares. In the end, it was determined that, in some cases, ponzi schemes were assembled to increase company value on paper for the purpose of pumping up share prices. For some companies, such as Enron, this involved the sale of imaginary services or "good will" to a company or subsidiary that would return the "favor." On paper, there appeared to be a great deal of forecasted revenue, but in reality, no real cash or nominal amounts of cash changed hands.

The implementation of the Sarbanes-Oxley Act explicitly increases the accountability of executives, by changing the way that companies account for their investments and the ways in which stocks are used for compensation. The Act also contains language that describes the need for executives to attest to the integrity of the financial statements they bring to market. It explains that corporations must afford the independent audit of business results and hold executives accountable for any discrepancies that may arise. Consequently, it is no longer possible for an executive to claim ignorance regarding the day-to-day operations and accounting practices of the business. Sarbanes-Oxley has essentially legislated that responsibility to the C-level executive.

In the following years of belt tightening, right-sizing, and outsourcing, the pressure to deliver tangible results forced many corporations to re-examine their business processes and to confirm their ability to comply with Sarbanes-Oxley. As a component of the SOX legislation, auditing firms were no longer permitted to conduct audits and then subsequently bid to implement the required corrective actions documented in the findings. The bidding as a result of the audits was considered to be a conflict of interest.

As these independent auditing firms began scrutinizing the controls, or lack thereof, greater pressure was exerted on businesses regarding their ability to pass IT audits, implement better controls, and increase accountability at the top of the executive chain. These actions, coupled with the on-going prosecution of the top executives embroiled in the scandals of the time, gave significant inertia to an already anxious executive community.

1.5.3 The challenge for implementing IT governance

As we mentioned earlier in this chapter, an organization may choose to implement an IT governance solution for many reasons. For example, the IT governance solution may be a new implementation or it may be an implementation to improve existing IT governance practices and processes. It is important to remember the significant role of organizational change in any IT governance implementation effort.

For example, many organizations responded to challenge of the IT governance implementation of SOX by treating it as a reporting problem. Many companies felt that increasing staff and formalizing the documentation of their financial reporting processes would be enough to stave off the wrath of SOX. Unfortunately, the Public Corporate Accounting Oversight Board (PCAOB) did not have the same view since they were dealing with obstructional executives and boards alike who were still trying to cover their tracks. Furthermore, many independent auditing firms were asking questions regarding how they should carry out corporate SOX audits. They requested the PCAOB to create a standard by which firms could be assessed.

The challenge for these auditing firms was that, although corporations could be audited against the integrity of their business controls, it became difficult to assess whether any regulation existed to manage these controls. The vast majority of enforcement mechanisms for these business controls were found within the IT infrastructure of these corporations and encoded within their software to conduct their day-to-day business.

During the SEC and PCAOB public hearings that ensued on the matter of auditing standards, the PCAOB and auditing firms agreed that the defacto standard for conducting such audits would be the IT Governance Framework of the Information Systems Audit Control Association. This framework is known as *Control Objectives for Information and related Technology* (COBIT).

Although COBIT provides a robust framework, along with a suggested implementation strategy, integrating the COBIT control objectives with, and adequately mapping the related inventory to, existing processes poses a significant challenge to any corporation. Since many executives saw SOX as an opportunity to streamline and improve the business through horizontal integration, they began to encounter other challenges as well. Integration of their existing framework for enterprise risk management, IT operations processes, satisfaction of defined maturity models, and implementation of security standards all while lowering costs and improving efficiency seemed a daunting task. Thus the need for a robust engineering-based approach to solve this problem became apparent.

1.5.4 Why IT governance

In today's business economy, effective and efficient enterprise governance is critical to the success of an organization. IT governance is an important subset that provides information sharing and applied technology. It offers the enterprise opportunities to transform the way it does business and is strategic to the growth of the enterprise. This importance and reliance on IT governance makes it an integral part of the governance responsibilities of the enterprise, not only for investors but also for regulators and auditors. IT governance is no longer optional for businesses.

1.6 The IBM IT Governance Approach

In Chapter 4, "The IBM IT Governance Approach" on page 87, we discuss the IBM IT Governance Approach (ITGA) and the value that this method offers your business. The IBM ITGA offers your business a market advantage by ensuring that your business executes its strategy with measurable results. It accomplishes this through execution of a formal life-cycle process that integrates and aligns business strategy and business execution across your entire company.

Your IT governance solution will be composed of many kinds of IT governance entities called *governance disciplines* as illustrated in Figure 1-4. Together these governance disciplines comprise the IT governance landscape for your business. The IBM ITGA is designed to provide your business with a consistent approach and a coordination point for the development and deployment of your entire governance landscape.
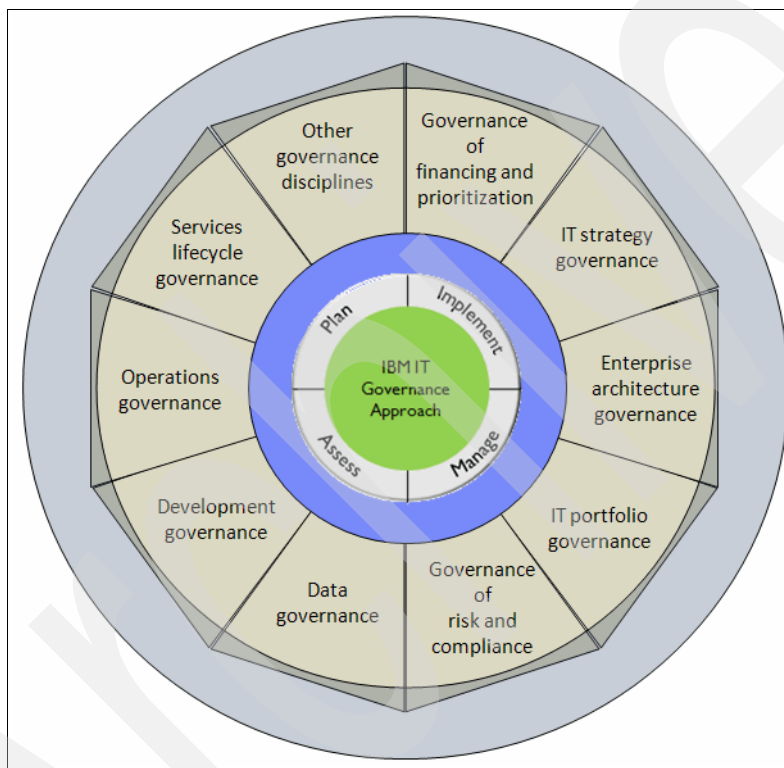

Figure 1-4   Support of the IBM IT Governance Approach for the whole IT governance landscape

Your vision for IT governance must incorporate ideas and information about the way you *execute your business strategy*. It is about how you operationalize and subsequently capitalize on market opportunity. Only at the lowest levels of decomposition is IT governance about decision rights, compliance with regulations, standards, and policies. While we do not minimize the extreme importance of these elements for IT governance, we assert that if your IT governance solution is primarily about being compliant, and secondarily about business execution, then you are likely to not benefit strategically from your implementation. You will have missed out on the larger opportunity that IT governance offers.

Furthermore, IT governance is not only about IT nor does it fit neatly inside the IT organization. Rather it spills over into and affects nearly all aspects of your business. IT development and operations are wholly reliant on their business stakeholders to deliver strategic business value.

Tip: IT governance is about the whole organization, not just IT.

Building organizational capabilities that meet all of your goals for issues related to decision rights and compliance, but that delivers the wrong products, services, or both, at the wrong time, or with poor quality, will result in a failed business. If your IT governance solution does not strategically align the execution of your business (where the business is leveraging IT), then what does?

Effective IT governance offers your business the freedom and opportunity to execute and innovate within a given set of *business constraints*. You must do this with the greatest possible degree of business integrity, coupled with the leverage (exploitation) of business processes, skills, partners, and technologies, which generally is your enterprise architecture.

Business constraints: In the context of IT governance, business constraints are typically manifested as regulations, standards, and policies. However, we must also include the limitations of available capital, technologies, and skills.

How do you manage and measure the effectiveness of your IT governance solution for your business? This is the core value proposition for the IBM ITGA.

Tip: For more details about the IBM ITGA, see the additional materials that are provided with this book. You can download them as explained in Appendix A, "Additional material" on page 105. In addition, you can find the plug-in on the Rational Method Composer Web page at the following address:

http://www-306.ibm.com/software/awdtools/rmc/library/

2

IT governance solution strategy

"I conceive that the great part of the miseries of mankind are brought upon them by false estimates that they have made of the value of things."

— *Benjamin Franklin*

Governance is about leadership. More specifically IT governance is about the ways in which leadership is expressed in an enterprise for meeting its IT strategy, goals, and objectives. Governance is also about gaining strategic alignment between the goals and objectives of the business and the utilization of its IT resources to effectively achieve those goals.

Strategic business value as measured by executive management generally involves company financials or other business stakeholder value. The realization of your IT governance solution is wholly dependent on expected and desired outcomes as evaluated by those stakeholders. It is constrained by adherence to necessary regulations, standards, and policies. The *outcomes* are most important. The way in which those outcomes are achieved, while remaining within operating constraints, will vary from one business to another.

Although there is no prescription for IT governance solutions, there must be guidance, practices, and measures that will be manifested in the most successful IT governance solutions. We present and discuss some of these strategic points in this chapter.

15

2.1 Essential elements of an IT governance solution

In the article "Operational IT Governance," the authors Cantor and Sanders define seven principles for operationalizing governance.[1] Of these principles, the following principles provide insight into the character of your governance solution:

► The Artifact Life-cycle Principle

The governed process artifact life cycles guide the governance solution.

► The Risk Principle

Measures and controls must be adjusted according to the level of risk.

► The Suitability Principle

The needs of the organization determine how the level and style of governance will be tailored.

► The Automation Principle

Technology makes the governance solution empowering and unobtrusive.

With this guidance, we define the following essential elements for your governance solution. Although building your governance solution without these elements is possible, we believe that their elaboration is important in the formation of a sound basis from which you should make all other decisions about your IT governance solution.

► Life-cycle model

Your governance solution should have a beginning, a middle, and an end. It is ideally designed so that:

– Each execution of the life cycle results in delivered business value.

– The governance of multiple projects does not establish the interdependence of projects. That is, each governed project is related to the governance life cycle in its own unique way.

– Serial releases of projects are enabled by a life cycle that may be executed back-to-back or in parallel as required.

► Intermediate objectives

Your governance solution should be decomposed into multiple intermediate objectives that collectively sum to result in the delivery of business value. Typically, your life cycle is decomposed into *phases*.

► Business alignment checkpoints

Coincident with the end-point of each intermediate objective, your governance solution should expose visibility points that are designed to measure project alignment with business criteria. Typically, each phase ends with a *milestone*.

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[1] Cantor, Murray and John D. Sanders. "Operational IT Governance." *The Rational Edge*. IBM Corporation, 2007.

> **Project progress:** Business alignment checkpoints should not be assessments of project progress. Project progress defines too narrow of a set of concerns and often sends the wrong message from the point of view of governance to project teams. At each checkpoint, your objective is to evaluate the relevance of the project within its intended business context. For example, you might ask the following questions relative to the project:
>
> ► Has the businesses need for a solution changed?
> ► Has the market changed?
> ► Has our strategy changed?
> ► Has our enterprise architecture changed?
>
> Assessing the progress of a project relative to its budgeted resources (monetary budget and planned schedule) is meaningless if it is not done within the full context of the business.

► Governance artifacts

Cantor and Sanders explain that, if you think of governance as a process, then the outcome of executing that process must be a set of tangible assets, often called *artifacts*.[2] We call the set of governance artifacts the *governance solution*. A typical governance solution consists of some of the following items:

– *Responsible Accountable Consulted Informed (RACI)* matrices for capturing the chain-of-decision rights and authorities.

– *Governance effectiveness measures* that capture at a business level how well the governed organization is delivering value to the broader enterprise, such as the average cost of a transaction. For the development function, an effectiveness measure could be time to delivery.

– *Operation metrics specifications* that define the day-to-day measurements as a basis for exerting control on the business processes. An example might be daily average response time. For the development organization, code churn, which is the frequency of changes in program source code, is an operational measure.

– *Policy libraries* that document the guidelines and controls on the authorized decisions.

– *Compliance specifications* that define which decisions must be documented to support audibility of the decisions.

► Governance automation infrastructure

An end-to-end automated and integrated tooling solution sets the foundation for an accurate and repeatable governance process. This process, together with tool-directed behavior, that is process enforcement, fosters the required business transparency. An automated solution infrastructure ensures both process conformance by practitioners as well as accurate measurement data across all participating projects. The transparency of this approach empowers managers and executives to make more effective decisions based upon near real-time project data.

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[2] Ibid.

2.2 IT governance for your whole business

IT governance is not a concern of just your IT organization. It is the concern of your whole company, especially for your business initiatives that depend on IT resources for execution.

Development of your IT governance solution without the full and proper context of your business is likely to result in a solution that is not designed to support the strategic objectives of your business. An IT governance solution that is designed and implemented "within the four walls of IT" is designed to benefit only the IT organization. However, in practical application that same solution may not benefit anyone since it has not considered the entire value chain of the business (customer to customer). Even worse, it will *negatively* impact the business in ways that may be relatively invisible, across organizational boundaries. The value of your IT governance solution may be compromised at your organizational boundaries. Without proper forethought and management support for building the necessary organizational transparency required to be successful, your attempt to build an effective IT governance solution through execution of the IBM IT Governance Approach (ITGA) will fall short of expectations.

> **Tip:** Developing organizational transparency is critical in the adoption of effective IT governance.

Using the IBM ITGA to build and execute your IT governance solution in the full and complete context of your business requires that you consider your company's *operating model* and *enterprise architecture* as illustrated in Figure 2-1[3].
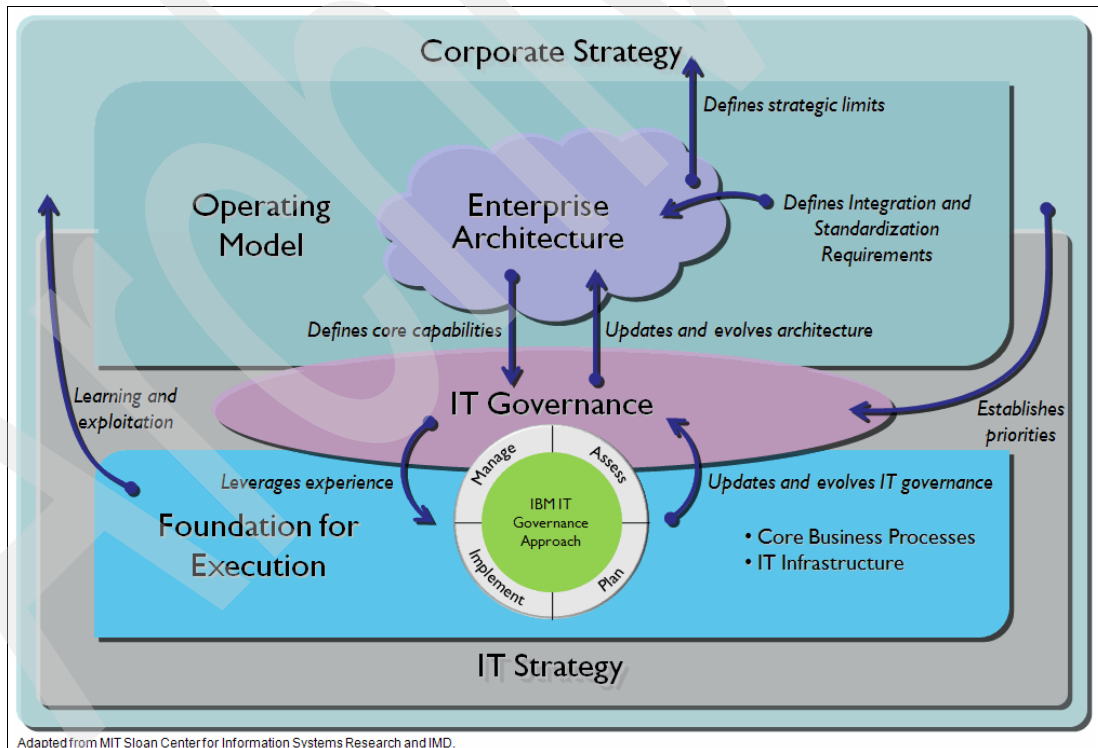

Figure 2-1   IT governance in full business context

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[3] Adapted from Robertson, David C., Jeanne W. Ross, and Peter Weill. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution.* Harvard Business School Publishing, 2006. Figure 1-2, p. 10.

Your business requires flexible frameworks for execution as evidenced by the (relatively) recent rise in popularity of object-oriented programming languages and even more recently by the introduction of the service-oriented architecture (SOA). These technologies are powerful enablers for business. They help serve in the capacity of decoupling business from IT, while maintaining the tight cohesion necessary to implement business processes using technology solutions. Your IT governance solution requires the same degree of business flexibility and agility.

Many businesses manage hundreds of projects across several organizational units. All of these projects are expected in sum to meet the strategic needs of the business. Companies expend a great amount of effort to establish even minimal coordination between projects, across organizational units, and with business partner relationships. Across these boundaries, companies seek to improve overall performance and to exploit business processes and capabilities.

Not all projects are created equal. Projects exist within a whole range of circumstances that make it difficult to coordinate their efforts effectively. They vary in technology, across organizational unit and business partner relationships, in time, by availability of skills and expertise and so on. While your business must execute against a single set of strategic objectives, as set by the board and executives, it is not necessary to have a single IT governance solution to achieve these objectives. Imposing this constraint on your business artificially and arbitrarily limits your business. Even worse, it compromises all business initiatives in an attempt to reach a "lowest common denominator" solution. Alternatively, it could make the IT governance solution either a scapegoat for poor execution or ineffective through methods of circumvention that generate huge amounts of waste and potentially expose the company due to non-compliance issues.

The need for addressing different kinds of projects with varying subtypes of IT governance is discussed in "The governance landscape: Steering and measuring development organizations to align with business strategy".[4] The IT governance landscape (see Figure 2-2 on page 20) is divided into several focus areas that represent various responsibilities in an IT organization. Collectively, these focus areas are referred to as *governance disciplines*. Each of these governance disciplines addresses unique IT challenges, but none of them are able to stand alone in isolation of all others. Your business must select the appropriate IT governance disciplines and effectively align them to meet the strategic needs of your business.

For example, a business that must deploy a software development organization to build important IT systems that support the business, such as core retail or inventory management, must also have the capability to strategically manage projects, portfolios, and processes. The ability to execute these two basic business processes requires coordination and alignment of both development governance and IT strategy governance.

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[4] Ericsson, Maria. "The governance landscape: Steering and measuring development organizations to align with business strategy." *The Rational Edge*. IBM Corporation, February 15, 2007.
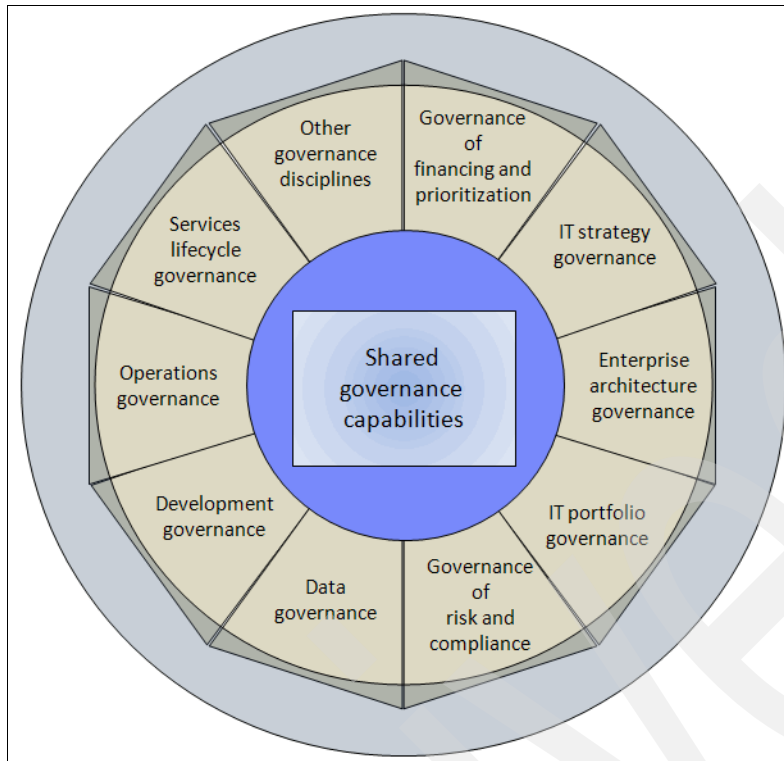
Figure 2-2   IT governance landscape

Your IT governance solution must be developed as a flexible architecture that is strategically aligned well with your business. This coordination and strategic alignment of various IT governance disciplines is referred to as *IT governance solution architecture*. It is a core contributor to whether you can adequately exploit and extend the varying capabilities of your business.

As a primary motivator for the kind of IT governance solution architecture that your business should have, you should look to the way in which your company does business. Robertson, Ross, and Weill assert that "to best support a company's strategy, we recommend that the company define an operating model."[5] They go on to describe an operating model as "the necessary level of business process integration and standardization for delivering goods and services to customers." Furthermore, they define four specific operating models from which you can identify the essential characteristics of your business:

▶ Diversification
▶ Coordination
▶ Replication
▶ Unification

If an operating model helps to define your company's strategy, and your IT governance solution is an essential ingredient in execution of that strategy, then their alignment is crucial. Furthermore, the operating model for your company is a predictor for your IT governance solution architecture.

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[5] Robertson, David C., Jeanne W. Ross, and Peter Weill. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution.* Harvard Business School Publishing, 2006. pp. 25.

Tip: You must develop your IT governance solution as an architecture that aligns multiple IT governance disciplines with the strategic objectives of your company (your company's operating model).

For example, if your company's operating model is one of diversification (low business process integration and standardization), then your IT governance solution for each (quite possibly) independent entity may be relatively isolated from the others. There may be only a subset of applicable (common) regulations, standards, and policies that apply. On the other end of the spectrum, there is the unification operating model (high business process integration and standardization). This type of strategy demands that your business is highly integrated and that sharing of information and resources is a critical component of leverage. In this type of environment, there may be no opportunity for regulations, standards, and policies to exist in isolation. They must be shared across the whole enterprise in order to realize the strategy.

Figure 2-3 illustrates the IT governance solution architecture. In this illustration, three IT governance disciplines are depicted. Each of these disciplines governs certain IT business processes that are designed to achieve specific results:

► The *development governance* discipline governs the development of a software application.

► The *operations governance* discipline governs the release to production process.

► The *services life-cycle governance* discipline governs the development of Web services.
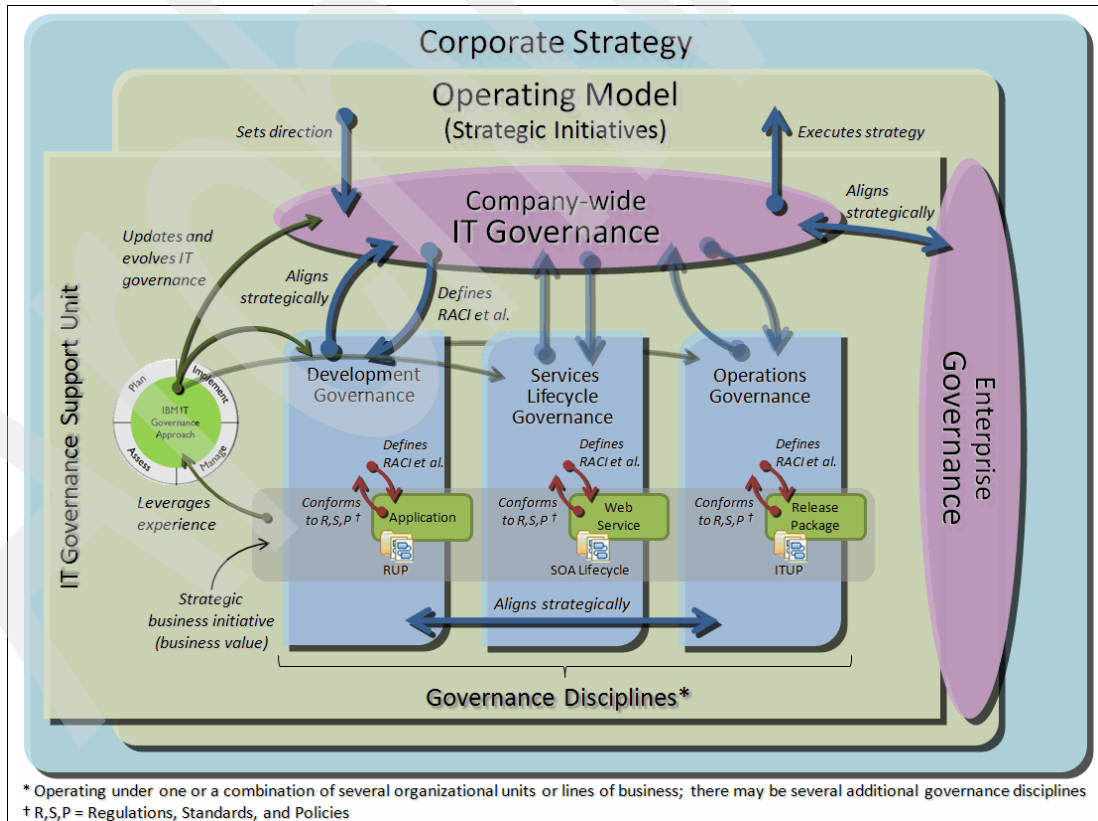

Figure 2-3   Architecture of the IT governance solution

In order for the business to realize strategic value from the business initiative, each of these governance disciplines, which may be contained within one or more organizational units, must align their efforts. This is the responsibility of your IT governance team, which we identify as your *Governance Center of Excellence* (CoE). Your Governance CoE shall develop a company-wide IT governance solution that aligns the core features of governance (chains of responsibility, authority, and communication) across the governance disciplines employed by your company.

> **Governance CoE:** Your Governance CoE is an organizational team whose goal is to maximize the reusability of governance assets and knowledge and to reduce the time and expense associated with the definition, implementation, and execution of your governance solution.

Figure 2-3 on page 21 also depicts the selected management processes that are engaged to deliver the product or services. In this case, the disciplines govern in the following manner:

► The development governance discipline governs the Rational Unified Process (RUP).
► The operations governance discipline governs the IBM Tivoli® Unified Process.[6]
► The services life-cycle governance discipline governs the SOA life cycle.

To establish the underpinnings of your IT governance solution architecture, you should assess the needs of your organization by using the IBM ITGA and select solution components from the available standard governance frameworks. The following governance frameworks are among the most popular ones:

► The Capability Maturity Model Integrated (CMMI) is a standardized, process improvement approach that provides organizations with the essential elements of effective processes. It can be used to guide process improvement across a project, a division, or an entire organization. It identifies five levels of maturity: initial, managed, defined, quantitatively managed, and optimizing.[7]

► The IT Infrastructure Library (ITIL) is an internationally recognized and constantly evolving collection of IT best practices that are designed to help organizations overcome current and future technology challenges. ITIL is mainly about execution. It addresses controls as part of its activities. IT departments around the world use ITIL as a roadmap to help guide efficient and effective implementation of current technology, including the realization of an IT service management strategy.[8]

► The IT Governance Institute (ITGI) version 4.0 of Control Objectives for Information and related Technology (COBIT) is an IT governance framework and supporting toolset that allows managers to bridge the gaps between control requirements, technical issues, and business risks.[9]

Table 2-1 on page 23 presents a subset of available IBM solutions for your IT governance solution architecture. Many other solutions are available and are continuously being developed.

> **Tip:** Visit the Rational Process Library for more information about IT governance, process, and technology solutions:
>
> http://www.ibm.com/software/awdtools/rmc/library/

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[6] For more information about IBM Tivoli Unified Process, see
http://www.ibm.com/software/tivoli/governance/servicemanagement/itup/tool.html.
[7] For more information about CMMI, see http://www.sei.cmu.edu/cmmi/.
[8] For more information about ITIL, see http://www.best-management-practice.com/IT-Service-Management-ITIL/.
[9] For more information about COBIT, see http://www.isaca.org/COBIT.

Table 2-1   IBM solutions for IT governance disciplines

IBM solutions	IT governance disciplines addressed
IBM Tivoli Unified Process Plan and implement your Service Management Initiatives, based on ITIL best practices. For more information, see the following Web page: http://www-306.ibm.com/software/tivoli/governance/servicemanagement/itup/tool.html	► Operations governance ► Governance of risk and compliance
SOA Governance Method SOA governance is the intersection of business and IT governance focused on the life cycle of services to ensure the business value of SOA. It is effective management of this life cycle that is the key goal of SOA governance. For more information, see the following Web page: http://www-306.ibm.com/software/solutions/soa/gov/lifecycle	► Services life-cycle governance
The IBM Rational Unified Process Good development governance practices enable organizations to determine the extent to which development investments deliver on their expected value. They also clearly define ownership in the organization for applications or products, for the overall portfolio of applications or products, and for the architecture on which applications or products are based. Additionally, development governance addresses an organization-wide measurement program whose purpose is to drive consistent progress assessment across development programs, as well as the use of consistent steering mechanisms. For more information, see the following Web pages: ► http://www-128.ibm.com/developerworks/rational/products/rup/ ► http://www-306.ibm.com/software/awdtools/rmc/library/	► Development governance ► IT portfolio governance ► IT strategy governance
RUP for Practical Software and Systems Measurement The Practical Software and Systems Measurement (PSM) is a team formed by the government, industry, and academia to bring together and promote the best practices of software and system measurement. Developed jointly by PSM and IBM, this plug-in integrates the measurement activities, artifacts, and concepts as described by the PSM, replacing the measurement concepts provided by the RUP base method. For more information, see the following Web page: http://www-306.ibm.com/software/awdtools/rmc/library/	► Development governance ► IT strategy governance
RUP for Service-Oriented Modeling and Architecture (SOMA) This update represents a major milestone in the RUP guidance around SOA because it provides a unified method that combines previous RUP for SOA content with content from the IBM Global Business Services SOMA method. For more information, see the following Web page: http://www-306.ibm.com/software/awdtools/rmc/library/	► Development governance ► Services life-cycle governance ► Enterprise architecture governance

IBM solutions	IT governance disciplines addressed
RUP for Compliance Management Use this plug-in to identify appropriate best practices, merged with your existing IT processes, to create your organization's unique compliant development process to maintain IT systems. For more information, see the following Web page: http://www-306.ibm.com/software/awdtools/rmc/library/	► Governance of risk and compliance
RUP with CMMI Compliance Support The RUP with CMMI Compliance Support is designed to provide compliance and process engineering professionals with guidance for solving the complex issue of managing RUP-based CMMI compliance initiatives. For more information, see the following Web page: http://www-306.ibm.com/software/awdtools/rmc/library/	► Governance of risk and compliance
IBM Rational Method for Portfolio Management The IBM Method for Portfolio Management describes methods and practices that provide guidance in the Portfolio Management domain. The current content offers guidance for planning and executing an enterprise portfolio assessment, business case management, and the periodic management and strategic reviews of initiatives. It includes substantial introductory material to the basic concepts of portfolio management. For more information, see the following Web page: http://www-306.ibm.com/software/awdtools/rmc/library/	► IT portfolio governance
IBM IT Governance Approach The IBM ITGA provides guidance to businesses to solidify market advantage. It ensures that your business executes its strategy with measurable result. It accomplishes this through execution of a formal life-cycle process that integrates and aligns business strategy and business execution across your entire company. For more information, see the following Web page: http://www-306.ibm.com/software/awdtools/rmc/library/	► IT governance

No matter how your IT governance solution architecture is described, you must carefully integrate it so that the combination of measured performance characteristics from multiple projects results in sensible data against which sound business decisions can be made. A poorly integrated IT governance solution will result in the inability to assess the true state of the business. Poor business assessment leads to making the right decisions for the wrong, or ill-advised, business condition.

2.3 IT governance and enterprise architecture

Your IT governance solution is a component of your business execution strategy for the evolution of your *enterprise architecture*. An enterprise architecture is the combination of the structure and organization of your business (organizational alignment) and the structure and organization of technology that strategically supports your business.

Ideally, your enterprise architecture captures and is reflective of both current and future business needs. It must be designed in such a way as to present patterns for services and capabilities that provide for anticipated, strategic business need. Your IT governance solution ensures that these patterns for services and capabilities emerge in a coordinated and timely manner.

2.3.1 Organizational structure

Your enterprise architecture either *reinforces* or *challenges* execution of your business strategy. It reinforces execution by providing the right level of services and capabilities and by making them immediately available for exploitation by your business. It challenges execution by creating barriers that require significant effort to overcome. The barriers to strategic execution include organizational alignment constraints (political, economic, geographic, and so on) that require specialized business processes to overcome them.

Some companies are so constrained by their organizational structure that they require contracts to be established, so that one organizational unit may do business with another. The difficulties in this type of arrangement are numerous, but the main point is that, fundamentally, arrangements like this are actively inhibiting the ability of the businesses to deliver strategically aligned value.

Figure 2-4 illustrates the challenge of aligning your IT governance solution and your organizational structure.
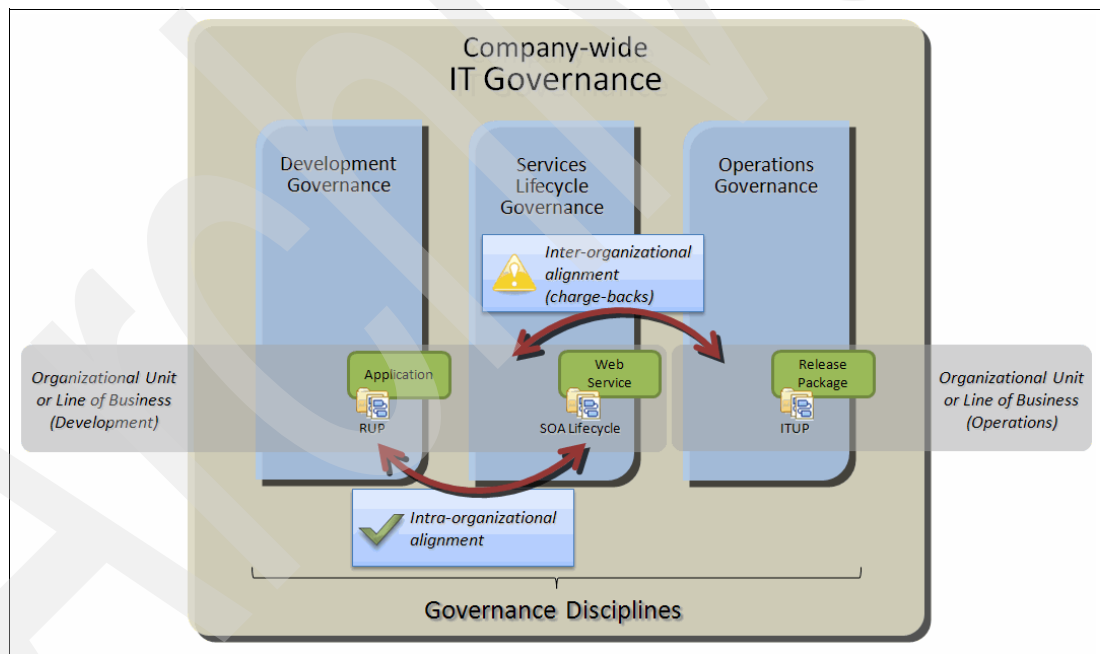

Figure 2-4   Alignment of IT governance and the organizational structure

Consider the following example of the challenges involved with IT governance solution and organizational alignment. If the technology infrastructure for a specific platform is owned (maintained and supported) by a single organizational unit (or line of business), then it is likely that users of that platform will have to make requests (contract) to the owners to make changes.

The questions now become of a strategic nature, for example:

► Who governs the time lines that are associated with the request for change?
► Do the owners really care about the time line needs of the users?
► What happens when multiple users compete for the resources of the owners?
► What happens when there is a conflict among the users regarding the platform?

While all of these questions are a matter for governance, they all require organizational coordination, which typically leads to bureaucratic overhead and delays in project schedules. A preferred approach that reinforces strategic execution may be to organize around a set of rigorous standards that define a business process resulting in shared (peer-to-peer) responsibility for management of (in this case) change requests to the platform. In fact, this is an abstraction of the open-source community approach to governance. Anyone can contribute, but they must follow (participate in) a specific business process. If the standards for contribution of changes are set high enough, little arbitration of change is required. If done properly, the process should be able to self-govern through the peer-to-peer environment that is developed as a result. This is a part of agile governance and is illustrated in Figure 2-5.
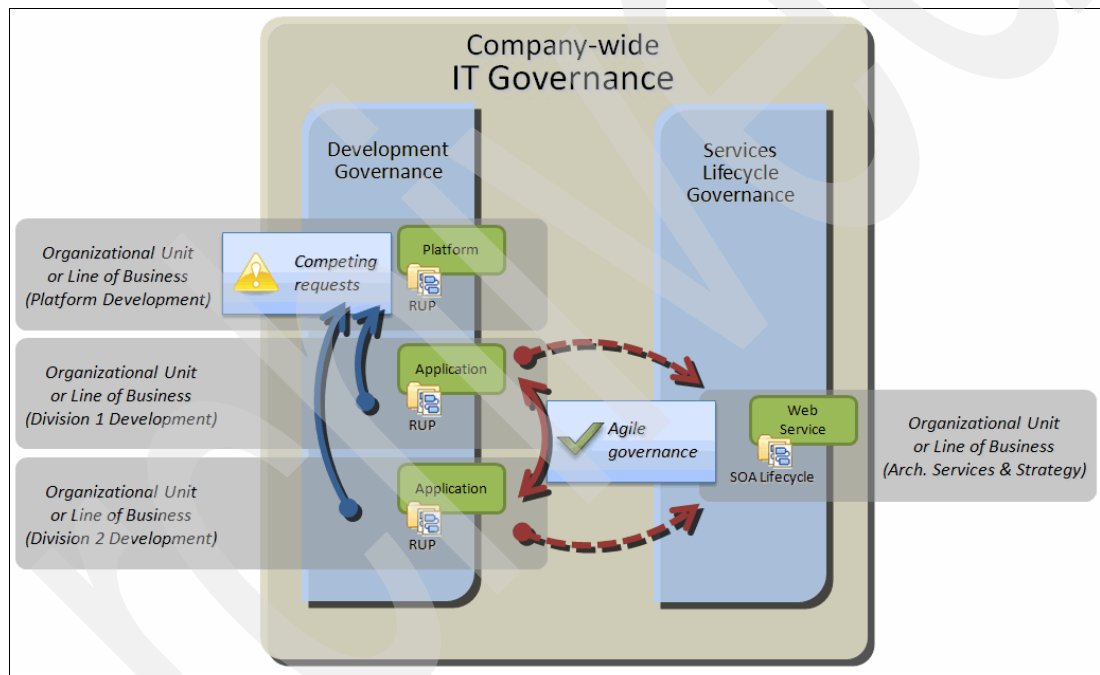

Figure 2-5   Agility in IT governance

2.3.2 Technology infrastructure

The technology infrastructure of your enterprise architecture generally should not be a project for your business. Ideally, tan organizational unit (or set of project teams) that has the specific and sole purpose of *implementing your technology infrastructure* should not exist.

> **Implementation of the technology infrastructure:** By "implementing your technology infrastructure," we mean to imply that there might otherwise be teams of people that build specific technological architectures that are void of business value. For example, they themselves do not generate a result of new revenue streams or increased market share.

The business value obtained from such an initiative provides no inherent business return on investment (ROI). It does not generate revenue or competitive advantage, although it can lead

to each of these outcomes. Projects or initiatives that result in the exclusive development of the technology infrastructure for your enterprise architecture yield indirect business value at best. The risks that are associated with built and unused technology infrastructure can be devastating to your business.

A less risky approach is to incrementally build your technology infrastructure by starting small, building on early successes, and focusing on your customer.[10] The development of your technology infrastructure should be an *initiative* that is thoughtfully planned and skillfully executed through coordination of multiple, ongoing project instances, of which each is designed to bring (either individually, or in combination) *strategic value* to your business.

> **Strategic value**: The projects generate real revenue streams or bring similar bottom-line value to your business.

As these projects execute, each contributes to and benefits from your enterprise architecture, both in terms of technology infrastructure and organizational strengths, in ways that continuously enable the future state of your business.

Your IT governance solution provides the necessary level of coordination and enablement that are required for the development of your enterprise architecture. It sets and encapsulates all of the required regulations, standards, and policies that are reflective of both internal and external business conditions that influence the rigorous development of your enterprise architecture. The IBM ITGA ensures your IT governance solution meets this strategic objective.

2.4 Risk management dynamics

Your governance solution must enable and incent good behavior. Good governance allows teams to meet the strategic objectives of the business without getting in the way. In this section, we discuss how your governance solution must be right-sized or tailored for projects based on those factors that enable your project team's ability to meet business objectives. Those factors that your governance solution must support are the removal of the barriers, or risks, associated with execution. The strategy for adoption of your developed governance solution depends on the kinds of risks that are associated with your project or operational need.

> **Important:** Governance solutions must enable and incent good, strategically valuable, behavior. Your IT governance solution must *not* be placed on your business as a constraint. Therefore, do not confuse governance with command and control. Good governance is a business enabler, not a business inhibitor.

The application of your governance solution should not be a "one-size-fits-all" approach. Not all IT projects are created equal by any measure, which may be a significant hurdle for many companies to cross. When it comes to governance execution strategies, many companies attempt to adopt a single solution that must be used for all IT projects. It makes no sense to apply the same governance execution strategy for all project instances and types. Projects vary in size, complexity, regulatory requirement, and relative business importance. These differences must drive the character of the applied governance solution.

The prescribed governance solution that is derived during the strategic alignment stage of the governance life cycle must not have its integrity compromised during enablement throughout

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[10] Hopkins, J. Marc. "How to Justify an IT Project With Uncertain Returns (And Still Make Your CFO Happy)." *CIO*, August 22, 2007.

the business execution stage. The control objectives of the governance life cycle that are to be met in strict accordance with regulation, standard, or policy must always be satisfied. However, these control objectives may vary based on project characteristics or project type.

We briefly look at examples of projects with varied risks. Health and life safety systems, such as medical devices, must be developed under a much tougher set of standards, such as Title 21 Code of Federal Regulations, than say Web-based e-commerce solutions. If the developed medical device fails in an unanticipated manner, a patient may be harmed or injured. (Of course, e-commerce systems rarely cause physical harm to humans). In the development of such solutions, the risks that are associated with development are more closely tied to the legal consequences of causing serious harm. Therefore, your governance solution must monitor issues that are related to regulatory compliance, fail-safe mechanics, and so on.

Another example is the need to govern projects with varying degrees of risk based on project cost and schedule variance. Projects that are analyzed by using these criteria fall within a theoretical range between *knowing* and *not knowing* how much time and money it will take to deliver the project. By using this example, we must concede that the business objectives associated with these types of projects are more closely associated with the risks of *efficient delivery of value* rather than the risks associated with health and life safety. Furthermore, the business value that is presented at the time of solution deployment exceeds (ideally, significantly) the cost of production or that the delivery time frame has not been extended so that the business opportunity has been lost (regardless of actual production cost). Again, the opportunity for a high ROI persists. In this example, your governance solution should monitor cost, schedule, and convergence on business value (delivery of the right system).

To summarize thus far, the risks associated with developing dissimilar systems differ, and the implemented governance solution must reflect these differences. Although these examples may not specifically align with your needs, the projects across your company will generally be reflective of varying business challenges and strategies and hence have varying types and degrees of risk.

The need to vary your governance solution based on project risk factors requires a strategy that allows companies with hundreds of governed projects to effectively use their company-wide IT governance solution. To do this, you require management and enablement of a limited number of *governance solution instances*. The idea of a governance solution instance provides a convenient vehicle to create a few variations of your company-wide IT governance solution, each targeting the various types of projects that are to be governed.

The term *instance* in reference to your company-wide IT governance solution denotes a specific tailoring or right-sizing. The tailoring of your governance solution enables and incents project teams to meet their strategic objectives based on the time-sensitive location of the project on an ideal risk profile, or more precisely, based on the project's specific risk reduction need.

Important: Tailoring your IT governance solution to enable specific projects (or organizations) does not relieve those projects from being strategically aligned with your business. All tailored variations of your governance solution must be strategically aligned.

In the next section, we discuss how IT governance and project risk reduction needs align. More specifically we introduce three key kinds of *project risk dynamics* that are used to help target your governance solution instances.

2.4.1 IT governance and project risk dynamics

Figure 2-6 illustrates the ideal risk profile for projects. This curve plots risk factors on the vertical axis against time on the horizontal axis. We now assert that projects in execution should reduce their risk over time. Furthermore, we assert that thoughtfully governed *and* managed projects should result in the retirement of risk at a geometric rate.
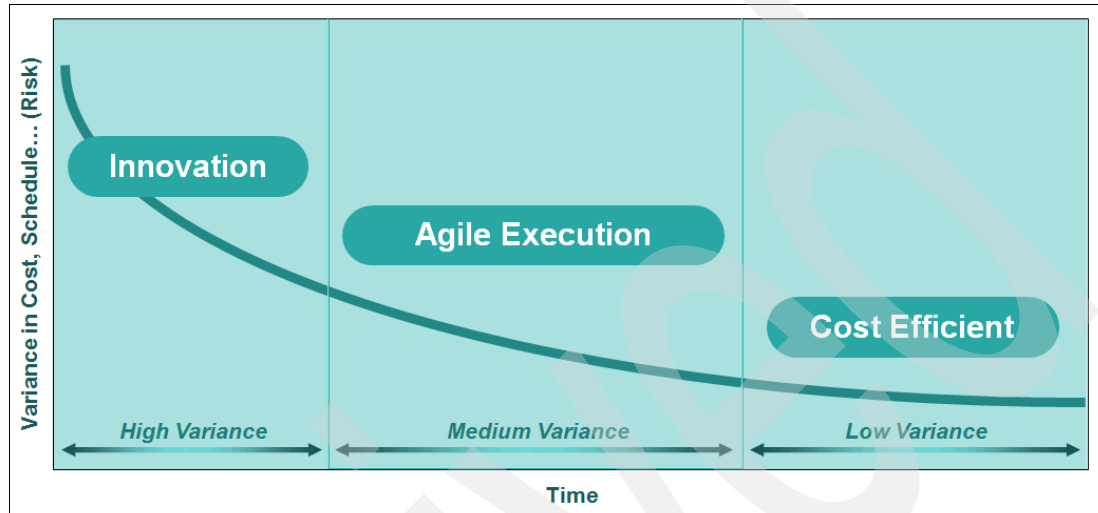

Figure 2-6   The ideal risk profile for IT projects

The kind of project strategies for the reduction of project risk is beyond the scope of this book. However, we acknowledge that the governance solution under which your project is managed must enable and incent the behavior of project teams so that risk may be retired geometrically. Your project teams must remain focused on the delivery of business value and not become distracted by unnecessarily building artifacts, typically documentation artifacts, that are related solely to the governance solution itself.

Historically, this has been a challenge for many companies. The development of artifacts in response to the governance solution (as opposed to the delivery of business value) has been erroneously used to assess project risk factors. The production of documentation artifacts does not reduce *real project risk*, but it reduces *perceived project risk* in that it makes people feel better. While documentation may increase understanding of the problem or solution, it does not mitigate real risk until that understanding is translated into decisions, which are then translated into an implementation. In the manufacturing world, this type of perceived risk mitigation is referred to as *inventory*.[11] Too much inventory is typically expensive for businesses.

As projects execute, the risk they manage should progress down the risk curve, from left to right, as a result of the combination of observable and measurable risk reduction techniques and the building and verification of *deliverable business value*. Deliverable business value is a statement of the immediately available (on demand) presentation of the desired outcome into production environments. That outcome is defined to be causal to the realization of improved company revenues or other strategic measures. Also the verification (for example, testing) of deliverable business value demonstrates a reduction in risk. The broader the verification coverage is, the lower the overall risk is.

A course-grained view of your governance solution is its focus on the reduction of project risk. For strategically aligned projects, this reduces risk to the business. Therefore, we talk about

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[11] Cockburn, Dr. Alistair. "What Engineering Has in Common with Manufacturing and Why it Matters." *Cross Talk: The Journal of Defense Software Engineering*. April 2007.

projects in terms of their risk variability. Furthermore, we want to identify the needs of project risk reduction in terms of its present location on the ideal risk curve. To begin this discussion, we introduce the following three project risk dynamics:

► Innovation
► Agile Execution
► Cost Efficient

Using these project risk dynamics, we can characterize that a project may operate with a high degree of innovation (Innovation), followed by a need to build and complete the right solution (Agile Execution), followed by a need to closely monitor and manage outcomes (Cost Efficient). However, not all projects experience all three project risk dynamics.

For example, a project to change the IBM CICS® operating system involves a small team of experts that know exactly what to change, how long it will take, and how much it will cost. This team may experience operating only under the conditions of cost efficiency. However, for National Aeronautics and Space Administration (NASA), starting the first day of a multi-year program to design and deliver the next lander to the surface of Mars is likely to be characterized as a highly innovative project. Its risks are comparatively much higher than making the CICS changes. Both of these examples demand different governance solutions based on their current risk reduction needs.

Applying a governance solution to your projects based on the dynamics of risk data will yield more meaningful consolidation and strategic alignment of objectively measured project data than using other methods. For instance, if you were to apply governance based on the size of the project (for example, perhaps measured by the perceived level of effort), then you are making the assumption that larger projects are more risky than smaller projects. Alternatively, you should group projects by technology or some other measure. The reality is that all of these measures of project type are reflective of the risks associated with the project. The three project risk dynamics group all of these more traditional notions of project type so that they can be aligned more closely with strategic business objectives.

2.4.2 Control point density

Control point density defines the amount of governance required at any given point in time. Figure 2-7 illustrates that control point density increases as projects get closer to deployment.
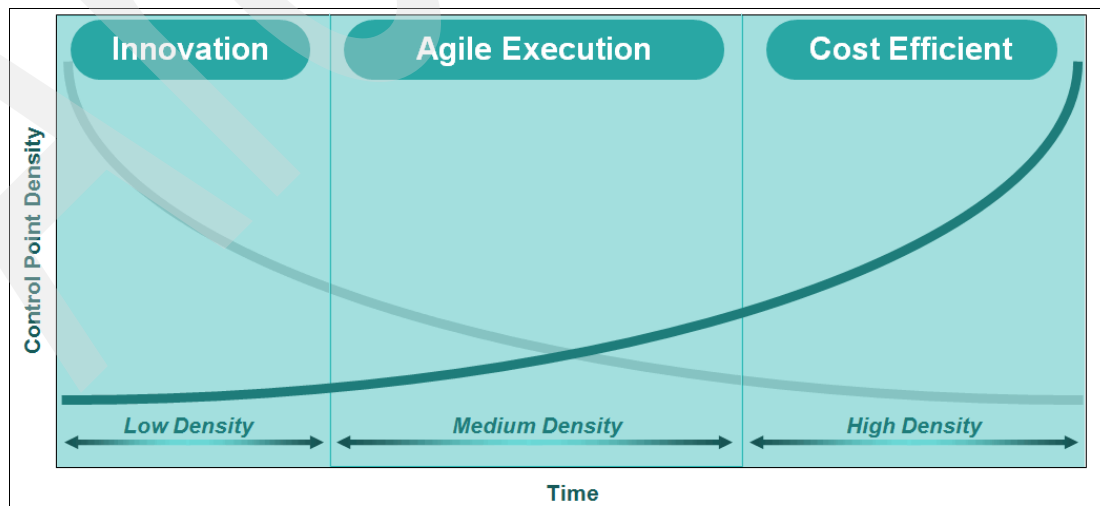

Figure 2-7   Control point density

For example, during the early portions of a project, such as during the requirements gathering activities, the number of verification points and inspection points should be lower. This affords the project team with a higher degree of flexibility to be as creative as necessary to develop highly innovative solutions. Conversely, a relatively high number of verification points and inspection points is typically necessary immediately prior to the release of system changes to live production environments. The control points that lead up to the deployment of a system must be designed to minimize the risk (to at or below acceptable and measurable levels) of the changed system by taking off-line a critical business process. The risks that are associated with system downtime must be carefully evaluated to determine all of the factors that may lead to failure. This type of effort generally requires a broad range of stakeholders, and therefore, may lead to more reviews and more sign-offs. Generally, more coordination is necessary to prevent business process failure at times of solution deployment.

Control point density is proportional to the increased chance of unknown or unmitigated risks that result in failed scenarios. Keep in mind that *control point density* refers to the number of control points imposed over a given period of time, and not the relative importance of each control point. This means that, although the control point density may be low near the beginning of project life cycles, a single failure in any single control point can still introduce unacceptable risk leading to business process failure.

2.4.3 Strength of governance

Governance strength (Figure 2-8) is defined as a combination of control point density and the degree to which projects must adhere to established procedures or methodologies that define how work must be accomplished. With *high governance strength*, people do exactly as they are told and perform checks on progress and quality indicators almost continuously. It may be characterized as oppressive or as micro-management and represents an extreme use of governance. With *low governance strength*, people have the flexibility to do whatever they want and rarely, if ever, check process or quality indicators.
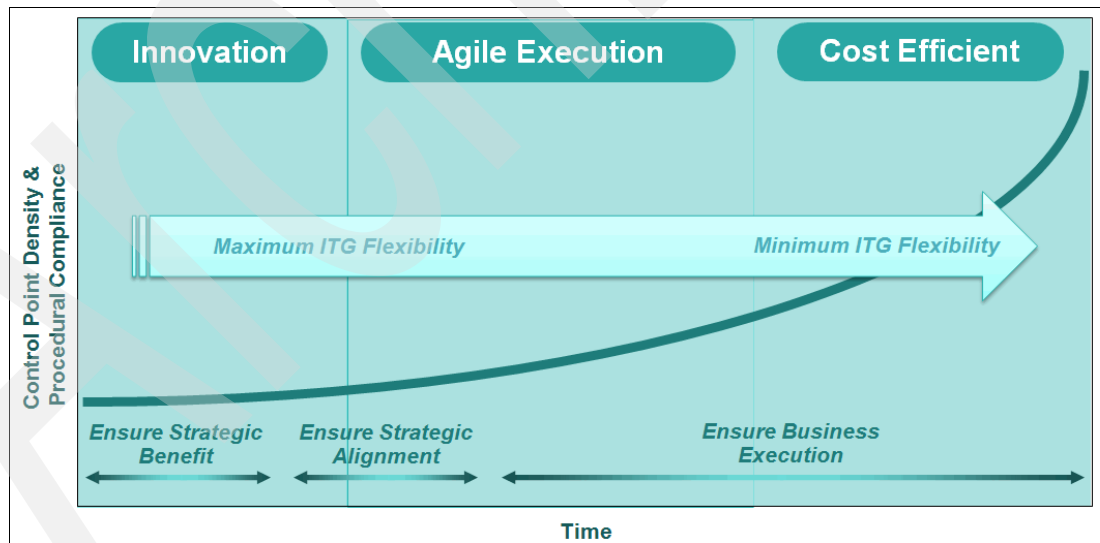

Figure 2-8   Governance strength and control point density across the ideal risk profile

With reference to the ideal risk profile, governance strength should be applied from left to right, from decreased strength on the left (Innovation) toward increased strength on the right (Cost Efficient). Stated another way, project teams that execute in the innovation space must be afforded a higher degree of flexibility and freedom to achieve their immediate objectives as opposed to projects that run in the cost-efficient space. Projects that run in the cost-efficient

space must be reasonably controlled and strategically aligned, so that changes to operational systems do not lead to business process failure, which could result in the loss of revenues or have a negative impact on health and life safety.

2.4.4 Risk and innovation

Innovation is "the act of introducing something new."[12] To remain competitive, many companies must design, develop, and introduce new or original products and services that they or no one else has ever done before. They must intentionally deploy projects with a high degree of cost and schedule risk.

For projects that operate in a high variance environment, we can declare that we do not know how long it is going to take or how much it is going to cost. Although it may be unlikely for people to admit this, it is often the acceptable truth. However, you must know how to best govern given this reality.

Traditionally, project teams combat the difficulty of unknowns by creating a work breakdown structure (WBS) in the form of a Gantt chart. The chart might have hundreds of entries, including what the team will be doing on the third Tuesday in May of next year. Furthermore, the WBS will include all of the governance solution milestones that must be satisfied along the way. After all, by meeting these milestones, we can feel comfortable about the progress the project team is making.

However, making management decisions from project scheduling data (WBS and Gantt charts) provides a false sense of security and prevents management from making correct, necessary, and critical decisions. Having to decide between cancellation or increased strategic investment in a project is never easy. It is even more difficult without the right information. Risk is reduced because we act upon information that is presented at the right time and in the right (most strategic) way. Making sound strategic decisions without access to objective, real-time data marginalizes the decision itself. As a result, making poor decisions is likely to increase risk, not decrease it.

How should you reduce the variance of your risk over time? How can you uncover the unknowns that prevent you from knowing more precisely how long it will take and how much it will cost? The tactical answers to these questions lie within the management process of the selected project life cycle, for example, the software development life cycle, ideally using iterative development techniques. The strategic answer, however, is the responsibility of your governance solution.

Your innovation governance solution must have the following key characteristics:

► It must be relatively lightweight and allow for the flexibility required of project teams to experiment and to discover the right strategic solution.
► It should have a relatively low control point density.

2.4.5 Risk and cost efficiency

Projects that operate in a low variance environment have ideally transitioned from a place of teams not knowing much to knowing what is needed for deployment to production. In doing so, the teams come close enough to realize the desired business value.

There is statistical insignificance in the unknowns on the far right of the risk curve as illustrated in Figure 2-6 on page 29. By definition, these projects have a precise measure of how long it will take and how much it will cost to deliver business value. However, as your

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[12] *The American Heritage College Dictionary, Fourth Edition.* Houghton Mifflin Company, 2007.

project approaches the far right of the curve, the point at which cost and schedule variance start to become irrelevant, it will incur additional and increasing risk of failure if left unchecked. This assumes that the objective to be met at the far right portion of the curve is the production deployment or other finalization event that results in achieving business value. Especially for deployments that launch all at once, risk will increase or decrease based on a single event, called the *turn-on event*. Although this risk can never be completely eliminated, it can be tremendously reduced through application of the right governance solution.

Therefore, your cost-efficient governance solution must have the following characteristics:

► It must be relatively inflexible and designed to protect or safeguard your revenue streams or other measure of strategic objective. For example, the solution should consider health and life safety or loss of expensive or irreplaceable capital equipment.

► It must have a relatively high control point density.

2.4.6 Risk and agile execution

The teams that have projects that operate in a medium-variance environment understand the problem and solution with a fairly high degree of precision, but are primarily challenged with the volume of work. Cost and schedule variance are tied to the ability to execute rather than the discovery of unknowns. Controlling costs and operating as close to the planned schedule as possible are the primary objectives. Additionally, if your project has the opportunity to deliver increments of a high business value solution into production with agile execution, then the risks that are associated with cost efficiency must also be monitored. We draw a distinction here between business value and technical or other kinds of value. Risk is only reduced through the addition of value that can be immediately available (on demand) in production environments, providing real benefit to users.

An agile execution governance solution must have the following characteristics:

► It must address concerns of operational efficiency. It must enable and incent a high productivity environment.

► It should have a higher control point density if you are delivering incrementally into production and lower control point density if your are solely focused on task completion.

2.4.7 Risk characteristics for the right-size IT governance solution

The introduction of your IT governance solution to your organization includes the need to affect both new or start-up projects and existing or in-flight projects. To make a company-wide transition to your governance solution, you must consider both projects simultaneously. Furthermore, as we have discussed, the determination of which of your projects fall into the Innovation, Agile Execution, or Cost Efficient space is to be based on a risk valuation.

The following risk-related project factors apply across all projects and should be used as guidance to understand where your projects may fall in terms of overall risk of implementation:

► Project timing

 – The location of each project on its time line
 – The inter-dependencies of projects

► Strategic importance

 – Enterprise architecture capability growth
 – Market capture opportunity

► Business value contribution

– Expected revenue realization

Table 2-2 describes, for each project risk dynamic, the exhibited (for in-flight projects) or anticipated (for start-up projects) risk attributes that should be considered while "right-sizing" your governance solution. View the descriptions both as starting positions to determine how each project should be initially governed and as a set of criteria to determine how the governance of each project should change over time. For example, use them to guide you in response to reduction of risk associated with cost and schedule variance. Your governance solution should include the details about how governance changes over time for a specific project. This is typically expressed through the passing of governance milestones or toll-gates as described within your governance solution.

Table 2-2   Project attributes by project risk dynamic

Project risk dynamic	Exhibited or anticipated project attributes
Innovation	► There are many unknowns in terms of both business and technical measures. The subject matter represents a fuzzy problem to solve. You are unsure and your customers are unsure. ► The digitization of new business processes or business processes that have not been previously digitized. The demand is for creative and innovative solutions. ► The project is designed to enable new enterprise architecture capabilities. Extending the enterprise architecture is akin to understanding what problem to solve before you solve that problem. Investment in new enterprise architecture capabilities affect the long-term agility of your company. ► Generally, the project provides no direct existing revenue stream to the business. "Green-field projects" are generally highly innovative because of their decoupling from existing technologies.
Agile execution	► Protection of existing revenue streams (most important) ► Enhancements or corrections made to existing systems ► Known business and known technologies
Cost efficient	► Significant enhancements to existing systems ► Known business and known technologies ► Protection of existing revenue streams

2.5 Alignment of business and IT

Your IT governance solution must enable project teams and incent good behavior in a way that benefits your organization from a business perspective, an (internal) IT perspective, and a business and IT alignment perspective (creating business transparency). In *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*, Robertson, Ross, and Weill discuss the alignment of business and IT using the term *linkage*.[13] Your business and IT organizations are *linked* together at all levels or your organization: the enterprise level, the business unit level, and the project level. Figure 2-9 on page 35 illustrates these linking mechanisms within your business.[14]

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[13] From Robertson, David C., Jeanne W. Ross, and Peter Weill. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution.* Harvard Business School Publishing, 2006. pp. 126-130.
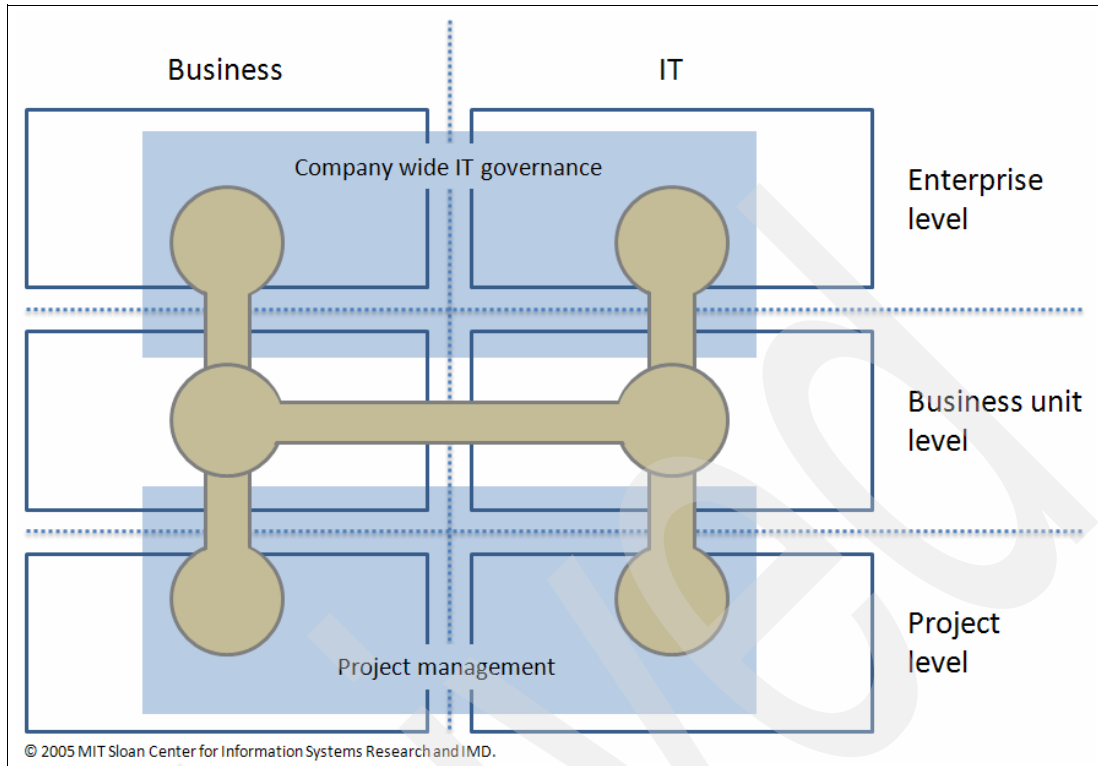
[14] Ibid. Figure 6-3, p. 128.

Figure 2-9   Types of linking mechanisms

Your IT governance solution should implement processes and control objectives for all three linking mechanisms. These linking mechanisms help to develop your governance solution by providing a reference to the boundaries (or scope) of your governance processes. They help you align the objectives of all stakeholders at all steps of business execution and across your enterprise. They enable transparency in decision making and execution. Furthermore, business transparency enables your organization to be continuously in alignment with business goals and objectives. To effect continuous alignment across your organization, we define a framework of IT governance value interests.

2.5.1 Value interests

Value interests are business concerns that the governing body has regarding governed projects that operate under a specific governance solution. They do not indicate or prescribe the design of any specific governance process, including milestones, activities, artifacts, or roles. They are not themselves a governance process, nor do they prescribe a set of governance milestones. They assert that the design of an IT governance solution should focus on the reduction of business risk as rapidly as possible (ideally, geometrically).

Relative to the development of your governance solution, value interests should guide your organization to discover the objectives for each of the *phases* of your governance solution.

Phase: We use the term *phase* here to describe the generic decomposition of your governance solution life cycle.

Value interests define how you enable your governance solution to yield value to your organization throughout the life cycle of your IT governance solution. Value interests are

described by the following three desires, realized in order, as you execute projects against your governance solution:

1. Ensure strategic benefit.

   The business realizes benefit from the availability of a solution, either directly or indirectly. *Direct benefits* include the ability to generate revenue from the solution without it being an enabler for something else, such as for sales of a new medical device. *Indirect benefits* include the creation of new enterprise architecture capabilities that make it measurably easier (less risk) and more cost efficient to deploy beneficial solutions, such as the capability to have a single view of your customers.

2. Ensure strategic alignment.

   The business realizes the leverage of existing enterprise architecture to deliver much more quickly and with much less expense. This is a measure of the project's contribution to or use of the enterprise architecture to support your operating model.

3. Ensure business execution.

   The business realizes productive and efficient creation and deployment of the right solutions. This is a measure of your company's ability to deploy marketable solutions.

In the following sections, we present a baseline description for a set of value interests that meet the criteria we have outlined. Your organization should begin with a discussion of these value interests as the starting point for developing those that best suit your organization and purpose.

Four IT governance value interests

In this section, we present and describe the following foundational value interests:

► Return on investment (ROI)
► Enterprise architecture
► Deliverable value
► Operations

The order of these value interests is important. It reflects the need for evolutionary development and deployment of the right solutions in the most cost and time efficient manner possible. Figure 2-10 illustrates the four IT governance value interests.
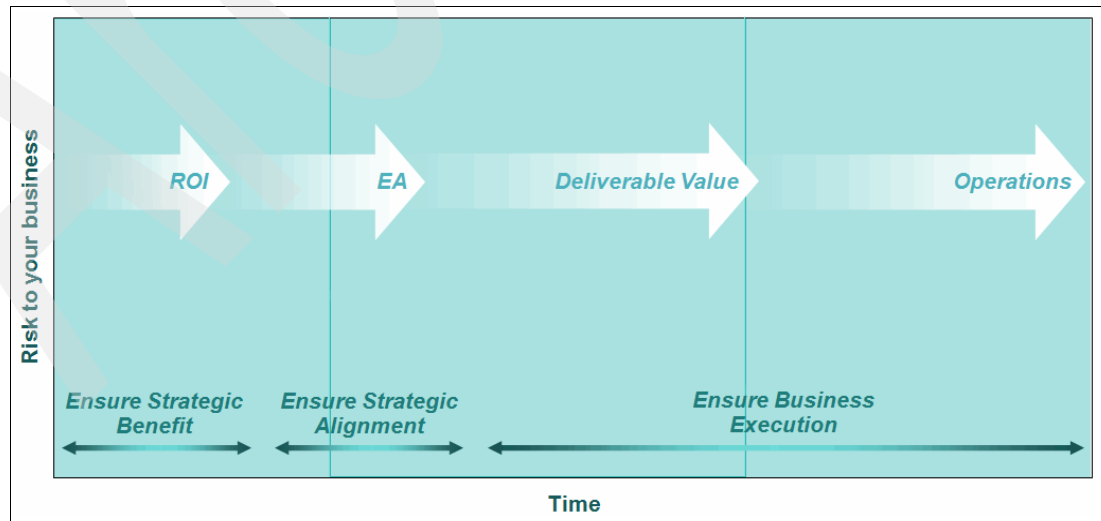

Figure 2-10   Four IT governance value interests

ROI: The first value interest

The first value interest of IT governance is the ROI of the project with reference to the overall strategic backdrop of the project and consideration of all the dependencies and business conditions that surround the project. The expected ROI from the deployment of the solution should be expressed in terms of revenue, business enablement (value to the enterprise architecture and operating model), market opportunity/market share, or some combination of all of these terms. As a project progresses through its early life-cycle stages, for example, through inception for a RUP managed project, the concerns of the business must surround the value that will be returned to the business if a solution were immediately available.

Enterprise architecture: The second value interest

The second value interest of IT governance is the alignment of proposed solutions with the enterprise architecture. Highly valuable solutions will fit within, support, or strategically extend the business enterprise architecture. Being in strong support of the enterprise architecture will maximize ROI, by minimizing cost or developing the solution, especially in more mature enterprise architecture environments due to application of modern techniques such as SOA. In addition, support of the enterprise architecture will minimize the chance of failure.

The enterprise architecture includes the technological architecture of inter-related IT systems, organizational alignment, which includes how divisions or lines of business inter-operate or the business processes. As a project progresses through its early-to-middle life-cycle stages, such as through elaboration for a RUP-managed project, the business concerns (those monitored by the governance board) must reflect the need of proposed solutions to align with the enterprise architecture. The concerns must align technologically in reference to SOA, reuse, and extend or support strategic objectives. In addition, they must align procedurally, meaning that participating business processes can work together in terms of financials, timing, command or control management, and so on.

Deliverable value: The third value interest

The third value interest of IT governance is the assured construction or development of deliverable value. This value interest centers around the basic ability of the business to execute as it is required to convert decisions into tangible, demonstrable business value as rapidly and as error-free as possible. Projects should be able to deliver on ROI at any time as a result of any change in business condition, such as yearly replanning or budgeting, re-organization, divestiture of capability, or shifts in market conditions.

As a project progresses through its middle-to-end life-cycle stages, such as through construction for a RUP-managed project, the business concerns (those monitored by the governance board) must reflect the need to obtain ROI on-demand. Project teams must maintain as low an inventory (unimplemented decisions) as possible. Doing so both minimizes costs (no inventory storage) and aligns expectations with just-in-time delivery. For example, decisions can be made with minimal waste or not implemented at all.

Operations: The fourth value interest

The fourth value interest of IT governance is the assurance that deployed systems deliver the expected ROI. Businesses are increasingly more dependant on their IT systems for the delivery of value to their customers and the maintenance of the associated revenue streams. When IT systems do not perform as expected, businesses suffer operationally, such as by losing customers, and financially, such as by losing revenue in real-time.

Projects must be able to deliver and operate solutions within defined expectations, such as by service-level agreements (SLAs) for performance, reliability, supportability, and so on. As a project progresses through is end-to-operational life-cycle stages, such as through transition and beyond for a RUP-managed project, the business concerns (those monitored by the governance board) must reflect the need to realize, maintain, and possibly increase ROI.

The IT governance value interest ramp

The IT governance value interests do not operate in a phased manner. After the value interest is introduced to govern the project, it remains as a measurement throughout the governed project life cycle. This approach provides the opportunity for the business to assess each value interest continually, in response to changing business conditions, and consequentially, to adjust priorities, scope, or resourcing, or to cancel or delay projects as needed.

Figure 2-11 illustrates the value interest ramp of IT governance.
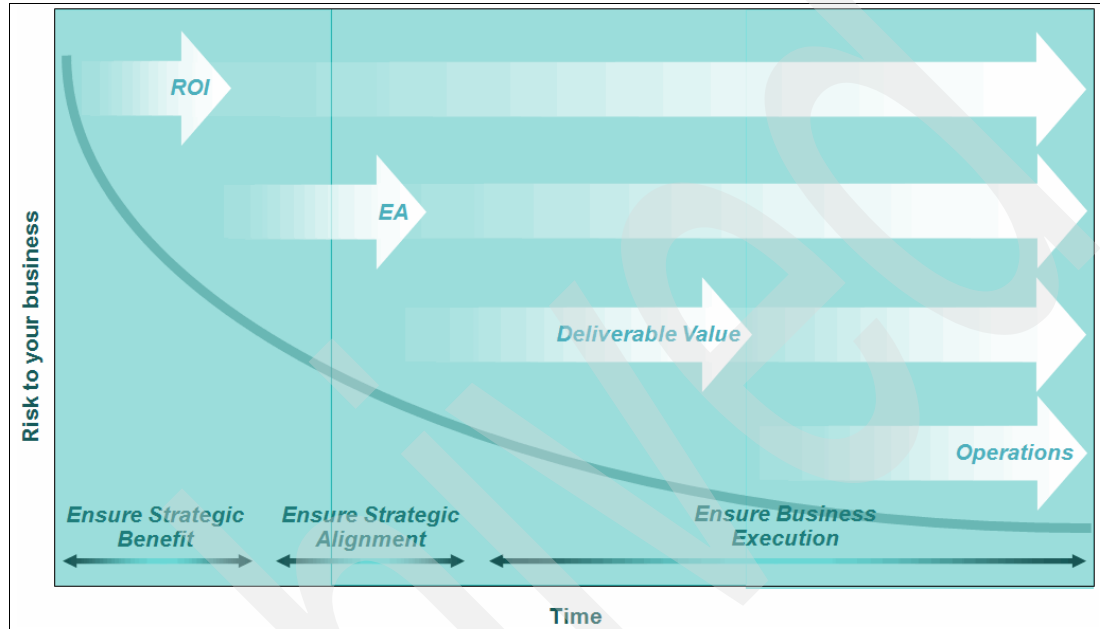
Figure 2-11   Value interest ramp of IT governance

2.5.2 Aligning the value interests and risk of IT governance

All IT projects start with their own level of risk. However, they all experience each of the four value interests of IT governance. Innovation, Agile Execution, and Cost Efficient classify projects based on their risk dynamic. Table 2-3 presents criteria that you can use to determine where your project is in terms of risk.

Table 2-3   Locating your project on the risk curve

Project risk dynamic	Identifying criteria
Innovation	► New business, new technologies ► Projects with many unknowns ► No existing revenue stream; speculative development
Agile Execution	► Significant enhancements to existing systems ► Known business, known technologies ► Protecting existing revenue streams
Cost Efficient	► Protecting existing revenue streams (most important) ► Enhancement or corrections to existing systems ► Known business, known technologies

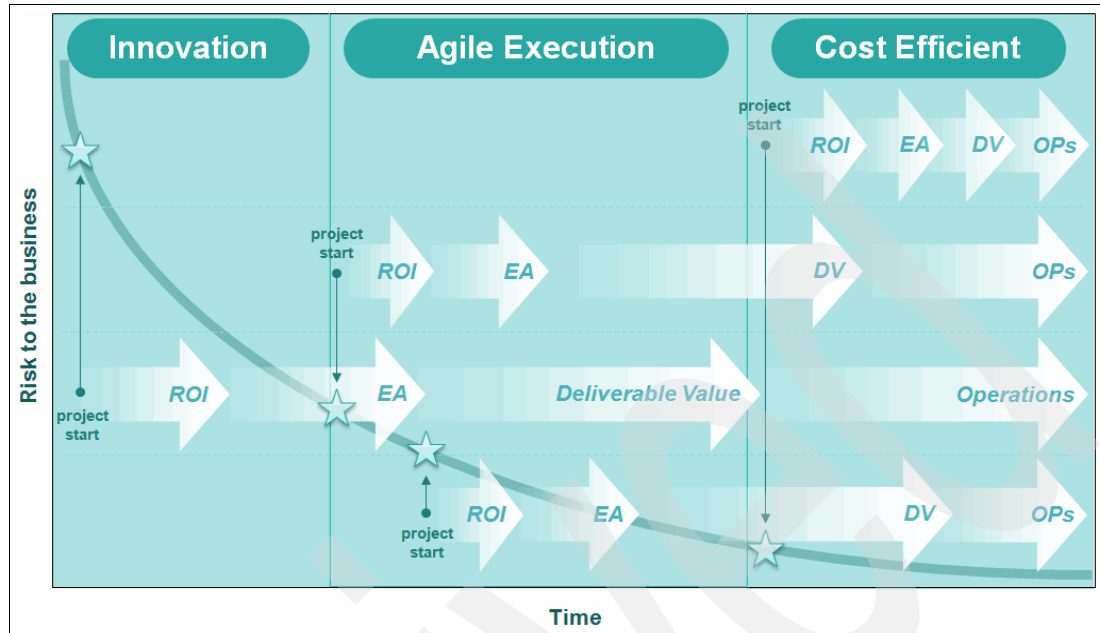Figure 2-12 illustrates the alignment between the value interest and project risk alignment of IT governance.

Figure 2-12   *Value interest and project risk alignment of IT governance*

2.5.3 Aligning IT governance and IT management

In this section, we describe how your IT management process may be aligned with your IT governance (solution) process. In order to drive this discussion, we present this section in the form of an example by using the context of a fictional company, ZYX Electronics, Inc. (referred to as ZYX).

ZYX is an electronics services company with operations in the U.S. and Europe. ZYX has created a development governance solution designed to govern all aspects of software development and delivery management processes. *Development governance* is the application of governance to development organizations and the business processes they use to conduct development programs. Good development governance practices enable organizations to determine the extent to which development investments deliver on their expected value. Good development governance implies the following concepts:

► Clearly defined ownership in the organization for applications or products, for the overall portfolio of applications or products, and for the architecture on which applications or products are based

► An organization-wide measurement program whose purpose is to drive consistent progress assessment across development programs, as well as the use of consistent steering mechanisms

The ZYX development governance solution is expressed in terms of a broad life cycle that is composed of four sequential phases. Each phase has been designed to transition to the next through a life-cycle milestone of IT governance. Each of these milestones is designed to assess the business value of project outcome to that point against the criteria of each milestone. The implementation selected by ZYX aligns each of the four milestones in a one-to-one relationship with the previously defined four value interests for IT governance. However, this is not a requirement because ZYX could have aligned their four milestones in

any way that they desired. The resultant alignment, however, should be selected based on criteria that best enables the business.

Example: ZYX may have created this alignment using such criteria as financial resourcing constraints, availability of human resources and technology, and organizational planning inputs (timing relationships taking into consideration organizational, or business unit, alignment). Alignment of these criteria provides the necessary business transparency to enable the most informed decision process possible. Employees at ZYX must have the right information at the right time to make the best decisions about project outcomes.

Additionally, ZYX could have developed a solution with more or less than the following four milestones that they have defined:

► Strategic Assurance Review (SAR)
► Business Alignment Review (BAR)
► Efficiency and Execution Review (EXR)
► Deployment Readiness Review (DRR)

ZYX has also selected the RUP as the IT management process for their software development life cycle. The RUP life cycle is itself is composed of four phases for execution:

► Inception
► Elaboration
► Construction
► Transition

Each of these four phases marks its transition to the next through one of four management process life-cycle milestones:

► Life-cycle objective milestone (assesses project scope)
► Life-cycle architecture milestone (assesses system architecture)
► Initial operational capability (system beta release)
► General availability (system general release)

Example of a life-cycle objective milestone: Each of the RUP milestones define objectives that are to be met by the project team through execution of the phase immediately preceding the milestone. For instance, the life-cycle objective milestone, which coincides with the end of the Inception phase, is designed by the framework of RUP to be concerned with the team's ability to adequately scope the project. There is a definite distinction here between scoping the project and attaining the goal of completing all of the system requirements. In terms of *value interest*, the RUP framework values an understanding of project scope by the end of Inception over anything else, including requirements complete.

Figure 2-13 illustrates an example of how IT governance and IT management life cycles may be aligned using the value interests of IT governance (see A to the right of the chart) as the basis for setting governance policy objectives.
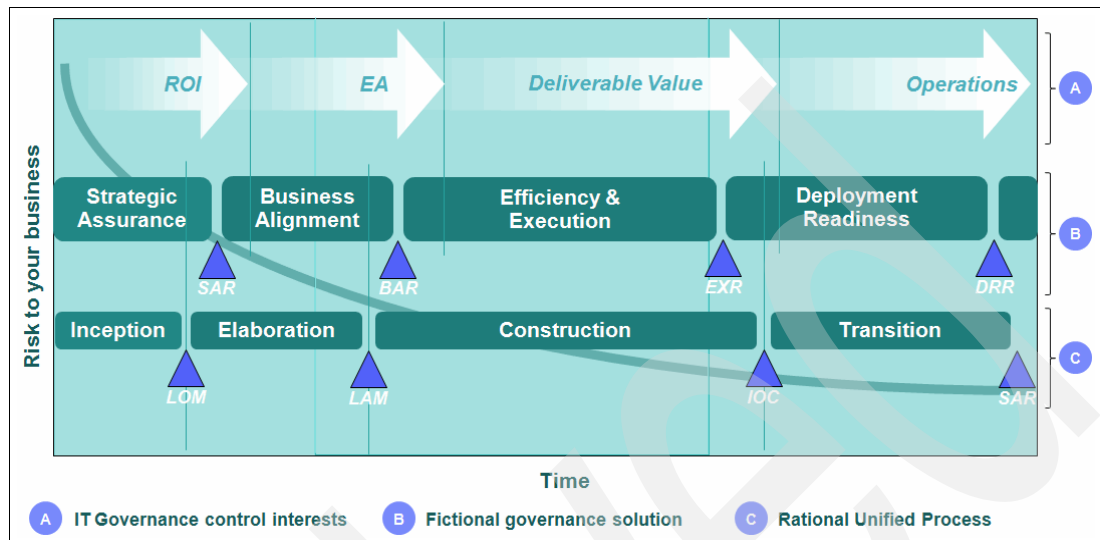

Figure 2-13   IT governance alignment with IT management

The design of the fictional IT governance solution (see B in Figure 2-13) has four major milestone reviews: SAR, BAR, EXR, and DRR. As previously stated, ZYX could have designed more or less major milestone reviews into their IT governance solution. There is no requirement to align a milestone interval of an IT governance solution, which ends with a milestone review, with the value interests (A) of the IT governance. Each of these reviews is designed as a major business decision point, such as continued funding, at which resource allocation may occur.

The alignment of the RUP phases and milestones (see C in Figure 2-13) with the governance solution has been crafted to provide the business with a specific benefit. For example, the Inception phase ends prior to the SAR. This way the project team has the opportunity to deliberately plan for system architectural work to be completed, so that a more thorough analysis of the business benefit (ROI) may be accomplished prior to the SAR. However, the life-cycle objective milestone (LOM) completes prior to the SAR. The completion can occur because the purpose of the IT governance SAR milestone is not to evaluate project requirements or scope. Rather the purpose is to evaluate ROI based on access to an appropriate solution that may be developed from those requirements. Completeness of requirements is not strictly necessary to make this assessment, nor should it be required.

The ZYX Quality & Assurance practice (via governance board membership) during an SAR might pose to the project team such statements as: "Show how your proposed solution improves present business processes in terms of the reduction in cost to execute those business processes. You may express cost in terms of activity time saved, throughput increase, enablement benefit, and so on."

The project team should use objectively measured data to respond. For instance, they may have built and executed a business process simulation by using IBM WebSphere Business Modeler.

By asking and answering these kinds of questions, the business is able to assess the ROI of the deployment of a solution. Furthermore, the governance board will evaluate this project's ROI against the ROI of other projects that may be competing for the same resources. This provides the business the ability to select projects that offer the greatest benefit via an

objective analysis of project data. Many other factors are not discussed here such as the risk of development in terms of access to appropriate skills, novelty of the technologies required to meet objectives, and so on.

The project team may have worked up a set of possible solutions that may then be evaluated through the IT governance process to determine which may be the most effective or efficient solution in terms of strategic business benefit. Allowing the architecture of the proposed solution or solutions to enter into the risk analysis equation provides the business the ability to evaluate the overall effectiveness of its enterprise architecture for supporting development of the system. If the effectiveness is scored against ROI, we would hope that the enterprise architecture supports the highest ROI projects more easily. At least, that would be a long-term desirable goal.

A low degree of alignment with the enterprise architecture may lead to higher risk and associated higher overall costs. An example of such alignment is if there is no way to plug into an SOA architecture and you need to build some enablers. However, on further analysis, such an alignment may also lead to the desired incremental addition of valuable enterprise architecture capabilities, reducing the risk and cost of future projects that can benefit.

2.6 Measuring business performance

IT organizations have traditionally concentrated on affecting team and individual (local) productivity and quality indicators as a means of increasing the overall efficiency of IT processes. In the following section, "Example of the need for driving business value, not IT value," we demonstrate the critical need to drive business ROI over IT ROI, or business initial rate of return (IRR). This example outlines the way in which IT organizations have traditionally attempted to measure business performance improvements, which is in isolation of the whole business value chain. This method can be effective when the core business is, for example, software development in a gaming software development company.

However, productivity of IT processes in most organizations is not an effective measure of business value. The relative cost savings of more productive project team members in isolation of the full end-to-end business process is not significant enough to garner executive interest. Nor is it significant enough to receive the attention and capital needed to fund ongoing improvement programs. Furthermore, the relative cost savings may easily reduce the overall productivity of the IT process or end-to-end business process in which IT process is a key constituent. Therefore, while IT organizations may see real localized value as an increase in the IRR, they often fall short of overall objectives because executives do not see the impact of this IRR on the business top and bottom lines. In short, they observe no ROI.

In financial terms, the ROI of improving IT process performance is not evident. The investment competes with other investments made by the business. Consequently, the ability to establish an explicit connection of IT process performance measures and business performance measures affords a greater context for the value of IT process capability improvements. The evaluation of the value of IT process capability improvements requires thoughtful alignment of measurable risk reduction criteria to the potential and likely ROI from the investment in improvement efforts.

Delivering ROI requires the derivation of monetary value from an underlying software product or other IT system changes. The opportunity costs, improvements of core business processes, missed market windows, and so on provide a business context for positioning IT projects. The simultaneous reduction of business risk and decrease in project cycle time are among the quantifiable benefits that IT project capability improvements can deliver. A framework and a core set of measurements that are driven from the business level down to

the project level flips the traditional bottom-up view of metrics. Defining this framework is a primary objective.

Example of the need for driving business value, not IT value

The evaluation of the value of the software investments of ZYX Electronics in the context of business performance requires thoughtful alignment and measurable risk reduction to the potential and likely business ROI. The software project ROI of ZYX Electronics has been defined as accomplishing the following objectives:

► Reduce project expenditure overruns (by 10% within one year).
► Reduce total project schedule overruns (by 25% within one year).
► Improve resource productivity (by 30% within one year).
► Increase the number of projects that complete at or above desired quality benchmarks (by 10% within one year).

In order for ZYX Electronics to deliver client value, these software project ROI statements must be evaluated on a measurement criteria of key business performance that prescribes the impact on the bottom and top line of corporate earnings. For instance, in their annual report, ZYX Electronics suggests that growth in core e-commerce markets will occur by lowering transaction costs and thereby attracting new transaction agents. What would a 10% to 20% growth in the number of transaction agents brought online in a fiscal year mean to the business performance of ZYX Electronics? What are the impediments to bringing a new transaction agent online and how are those impediments measured? How do the software project ROI statements bolster an increase in the number of transaction agents brought online?

2.6.1 Challenges for measuring business performance through IT

Several significant barriers are associated with the ability to measure business performance based on individual project contribution. The challenges stem from the inherent difficulties in mapping project performance indicators to business performance indicators in a way that demonstrates a causal relationship between the two.

It is well understood that measurement programs affect the outcome of the activities that we measure. In fact, taking measurements of practitioner contribution is one good way to measure programs. However, if you are not careful about what you choose to measure, you will achieve results that are aligned with the measurements rather than those that are aligned with the desired result. If you choose the wrong measurements, you incent undesirable behavior. Choosing the "right" measurements will aid your ability to obtain the desired result.

However, the desired result may not be obtained in a way that most people would predict. Plans change, requirements change, markets change, and business strategies change all within the time frame of a single project. Your business must be positioned with processes and procedures to react to these "course correcting" events. A poorly conceived measurement program will consistently and predictably ignore the reality of constant change.

For example, if you choose to measure project performance based on earned value contribution, then you are really measuring whether the project is adhering to its predefined plan. Measuring earned value ignores the possibility that the plan may not be the most effective way to achieve the desired result. Adherence to plan provides a false sense of progress and most often leads to cost and schedule overruns.

Furthermore, in the context of measuring business performance, we must recognize that measurements must be taken at several levels within an organization. The measurements that are important to a project team's performance may not be interesting to executive management. There must be a continuum of interconnected and causal measurement data

from the bottom of your organization to the top of the organization. Many companies have referred to this as the "rolling-up" of metrics information to gain an understanding of the overall scope of the project. This is a common component of project portfolio management and must be reflected in the features of software solutions for portfolio management as it is in IBM Rational Portfolio Manager.

The rolling-up of metrics information from the project level to the executive level presents a significant challenge for most organizations. While the kinds of measurements needed at the project level are fairly well understood, the measurements in the mid- to upper-levels of management are not understood. At least, they are not causal to the project-level measurements. Companies must generally cross three hurdles to more effectively build the executive view of the business performance of IT projects:

► Measurements must be objectively collected at all levels.

   There must be no opportunity to manually enter or otherwise manipulate measurement data. In cases where manual data entry is an acceptable practice, there must be a complete audit trail of the entries as well as a measure of the corresponding introduction of increased risk due to individual subjective input.

► Measurements must be automatically collected and automatically rolled up.

   Organizations have a strong tendency to translate information manually from one level to the next, that is from the project to line of business. The necessary automated systems are not in place or are not effective or manageable.

► Measurements must support the achievement of the desired result at each level.

   The right measurements must be selected to align with the business objectives at each level. Do not use project-level metrics to assess business value and risk reduction.

The ability of your company to develop a comprehensive measurement program that serves the needs of all levels of management may be further complicated by the following issues and misconceptions:

► Culture barriers hinder development.

   Practitioners at all levels, especially at the project and middle management levels, generally have limited, if any, visibility into the desired business results that are associated with the project. They may claim, "It is not my job." No context nor governance authority exists to relate project metrics to business metrics.

► Governance is command and control.

   The governance solution in place does not empower project teams to make decisions regarding the achievement of desired (strategic) business results.

► Measurement systems are intrusive.

   The misconception that having to measure, or to implement a measurement harness, will slow productivity of the organization by requiring project teams to enter data into the measurement system. This is an old way of thinking. Such software platforms as the IBM Rational Software Delivery Platform automate these tasks to ensure compliance with the measurement program.

► Management is always checking up on practitioners.

   Teams might have the feeling that somehow the measurement program will shine a spotlight on their work and performance and management will use their findings to evaluate individual performance. The fact is that measurement programs are used to evaluate business performance, not individual performance.

- ► Measurement programs show true progress.

  The institution of objective measurement systems, over subjective measurement systems, looks for indicators of problems or areas of concern in the program. There is a lot of room to hide behind subjectively collected measurement data. The thought of responding to true project status (earlier in the life cycle) may cause concern for project teams that operate reactively rather than proactively.

- ► The ROI has not been defined.

  At all levels in your organization, an honest assessment of the desired business results must be defined. This information may not exist in any formalized documentation, such as within a balanced scorecard, but is necessary to ensure that the organization is strategically aligned from top to bottom.

2.6.2 Balanced scorecards indicate performance criteria

Choosing what to measure is a strategic component of your IT governance solution and must reflect the goals of IT and the corporate strategy. In particular, measurements must reflect the business value that is obtained as a result of deployment of the governed project solution into production. Business value should be analyzed in the context of both the specific operational model in which the production solution must execute and the business value space as illustrated in Figure 2-14.
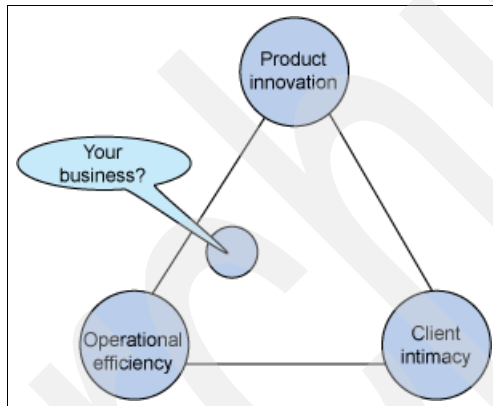
Figure 2-14   The business value space

The development of a measurement framework that is integrated into your governance solution and supports the primary business objectives or strategy of the organization is critical to the effectiveness of your governance solution. Without this framework in place, your governance solution has no feedback loop. Also future enhancements to your governance solution may not yield predictable (convergent) results. Additionally, your measurement framework must include all company levels and organizational units.

The strategy for development of your measurement framework begins with an understanding of what you should attempt to measure at each level of your organization. Generically, you must measure the ability of your company to deliver value to your customers. Your company strategy must define how to do this.

Furthermore, value is a relative term. Your company's organizational structure is strategically aligned so that each organizational unit (line of business or support unit) delivers some incremental value, so that, when combined, they deliver top-line customer value. The result is in increased revenues, market share, or other financial measure of company-wide achievement. The alignment of value delivered at the boundaries between organizational

units must be examined. When this *value contribution* is defined, you can then move to the discovery of how and what to measure in order to achieve that value contribution or desired result. One way to achieve this strategic understanding of your business in order to measure your performance is by using a balanced scorecard, which is illustrated in Figure 2-15.[15]
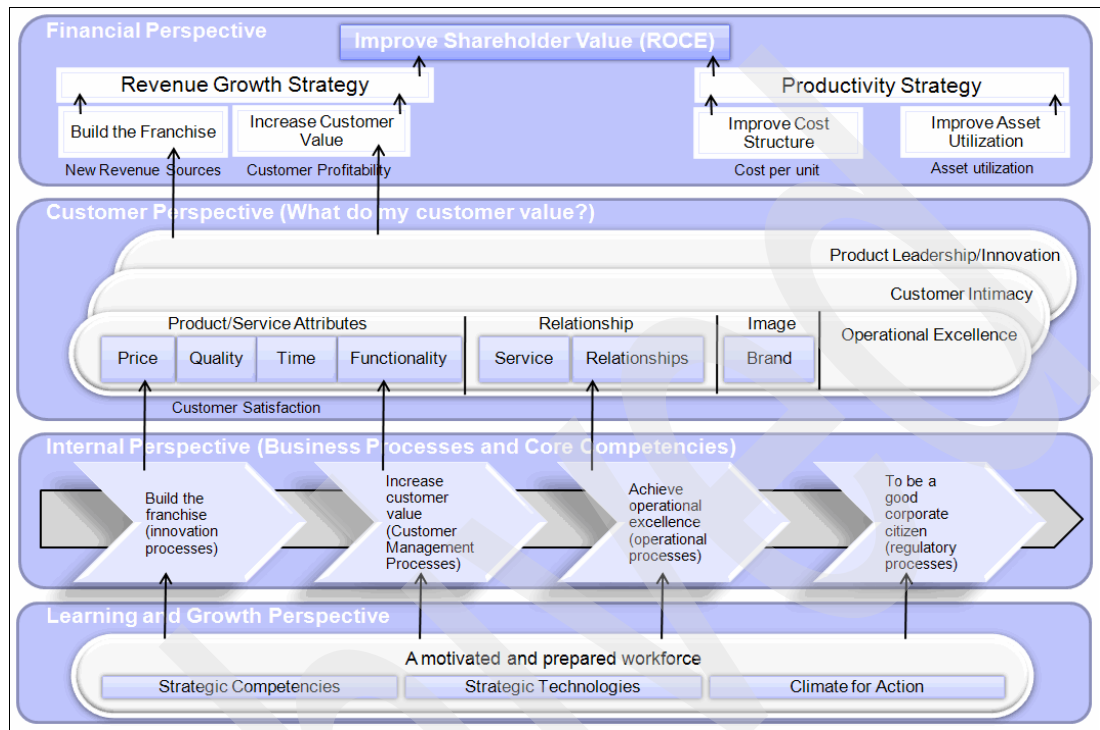

Figure 2-15   The balanced scorecard, a generic strategy map

A collection of balanced scorecards provides the foundation for understanding how your company creates value and executes strategy. The balanced scorecard is not a list of measures, but rather a description of your organization's strategy. The balanced scorecard is implemented as a *strategy map* that defines the organizational linkages that are needed to execute your strategy. At the boundaries of these organizational linkages, value is exchanged in alignment with company strategy.

Taking a balanced scorecard approach, your company first develops a single *corporate scorecard* to define the strategy for the company as a whole. The corporate scorecard aligns the following items:

► Company financial objectives with your perspective of how customers should perceive you

► The business processes and core competencies that are required to meet your customers' expectations

► The skills, knowledge, and technologies that are required to execute the strategy

Following the development of the corporate scorecard, each organizational unit, or line of business, builds its own scorecard with their own strategy by using the corporate scorecard as a template. The *organizational unit scorecards* must be consistent with the *architecture* of the higher-level scorecard (relative to the organization structure). The use of the term architecture refers to an alignment (or traceable map) of value creation. The organizational unit must execute (as defined by its scorecard) the strategy of its parent scorecard. For instance, the

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[15] From *The Strategy-Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment* by Robert S. Kaplan and David P. Porter, Harvard Business School Press. Copyright © 2001 by the HBS Publishing Corporation. All rights reserved.

customers of an organizational unit may not be the same customers as those defined in the context of the corporate scorecard. However, the *value* exchanged with the organizational unit's customers is strategically aligned with the corporate customer. This value must be measured.

Finally, *support unit scorecards* are created that reflect their strategy and value creation. *Support units* are those organizational entities that are used to leverage economies of scale, infrastructure or knowledge sharing, for example, finance, marketing, or information technology.

This linked collection of scorecards (corporate, organizational unit, and support unit), as shown in Figure 2-16, defines the highest- and lowest-level strategies for the execution of the corporate strategy. Value is created within each organizational unit and shared upward and along the boundaries of those units. This is your measurement framework. Measurement across the strategic alignment of your business ensures that what you measure matters to your business and ultimately to your corporate customers. We refer to this concept as the *measure-up measurement strategy*.

> Traditional definition of business value
>   ✓ Return on Capital Employed
>   ✓ Operational Excellence, Customer Intimacy, Product Innovation

Value to Shareholders and Customers

> Measured by the ability to improve and support business definition of value
>   ✓ ROI of IT Investments
>   ✓ Scorecards for Alignment to Business Initiatives

Value of Information Technology

> Measured by ability to support core business operations, deliver new benefits to end users
>   ✓ Earned Value of Project Execution
>   ✓ Some business case assumed

Value of Projects

> Measured by improvements in quality of solution, improved productivity, improved time to market of product/service delivered to the business
>   ✓ Value is defined in terms of improved
>   ✓ Value is defined in terms of improved capabilities in delivery

Value of Improved Delivery Capability

Figure 2-16   Balanced scorecard linkage that helps define value at each organizational level

2.6.3 Measuring up to connect business and IT value

The term *measure-up* is used to describe what is typically referred to as the "rolling-up" of measurement data. However, we give the term a slightly different definition here. By measure-up, we refer to more than the academic aggregation and consolidation of data collected over multiple, usually interdependent, projects.

We do this with the recognition that executives care little about low-level constituent measures such as source lines of code created, defect density or requirement churn that leads to project scope or schedule creep. However, with the dependence of business processes on software, these lower-level measurements, if not properly managed, can have a critical impact on those measurements that are important to the executive. Therefore understanding the connection between measurements taken at all levels (measuring from the lowest levels up to the business level) helps you focus on which lower-level measures are the most important.

Executives must understand that a portfolio of projects can deliver strategic value to the business, resulting in increased financial performance. In the article "Maximize ROI: Six Time-wasters CIOs Need to Avoid," Sandra Rossi suggests that if you want to communicate meaningful metrics on the value of IT, focus on business metrics not IT metrics. It is a waste of time when "CIOs communicate by using IT metrics instead of focusing on business performance. They should be linked to familiar business measures, such as business goals, business strategies or business processes, and should show the current status and progress to date."[16]

> **Tip:** Any expenditure on capability or performance improvement should be measurable against those areas within the business, not just within IT, that matter to the executives.

A measure-up aggregation of measurement data supports the ability of your company to track macro performance issues against business strategy. This method offers the following benefits:

► Formulation of a basis for discussing the value of IT to the business

   Strategic IT initiatives are valued in direct correlation to the business initiatives that they enable. Couple this with an activity-based approach to costing IT services, and IT executives can begin to answer the question, "What do we get for our IT investment?"

► Development of the business case for IT capability improvement efforts into business initiative support

   This limits the number of purely internal IT projects.

► Incremental improvements to capability

   They are more likely to succeed when they have the weight of a core business initiative dragging them rather than a stand-alone project looking for places to inject pilot programs and first adopters.

► Identification of redundant and unnecessary components perhaps leading to defects or misalignment in the enterprise architecture strategy or the company operational model

► Coordination of increasingly complex systems (or systems of systems) that add up to create the ultimate business value

► Cross-project, cross-initiative, or cross-organizational prioritization

   This concept refers to the creation of the kind of business flexibility that leads to rapid response to regulatory, market and corporate needs.

Practically speaking, when you measure-up, you raise the measurement one level and decrease the number of measurements. Find a higher-level measurement that will drive the right results for the lower level metrics *and* establish a basis for making trade-offs.[17]

As you measure up, you begin to gain a more broad view of your organization and eventually your whole business. Your company benefits greatly from your governance solution when it establishes a perspective of the whole and not just the parts. This is what your governance solution measurement framework, and indeed this activity, is about.

As upper management is faced with decisions about whether to continue to fund and support projects, they make decisions, in part, based on the optimization of the whole. For example, often times a single project is part of a larger, or longer-term, initiative. Making decisions regarding the initiative based largely on isolated or local project knowledge incurs risk due to project interdependencies. It does not make sense to delay or cancel a $1 million project in

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[16] Rossi, Sandra. "Maximize ROI: Six Time-wasters CIOs Need to Avoid." *Computerworld*, April 27, 2007.

[17] Poppendieck, Mary and Tom. *Implementing Lean Software Development: From Concept to Cash*. Addison-Wesley, 2007. p. 40.

the face of a $500 million market opportunity, assuming that the initiative is strategically aligned with business objectives.

You can use the following steps, which are illustrated in Figure 2-17, to guide you through an initial analysis to determine the higher level, business performance metrics that result from the more tangible, lower-level metrics:

1. Identify core processes and understand how performance is measured (see Figure 2-18 on page 50).

2. Understand performance improvement projects and goals.

3. Map project dependencies that require change to implement performance projects.

4. Connect relevant delivery measurements to IT projects that implement business process changes. For example, you might ask, "What does variance in IT delivery do to improve project ROI?"
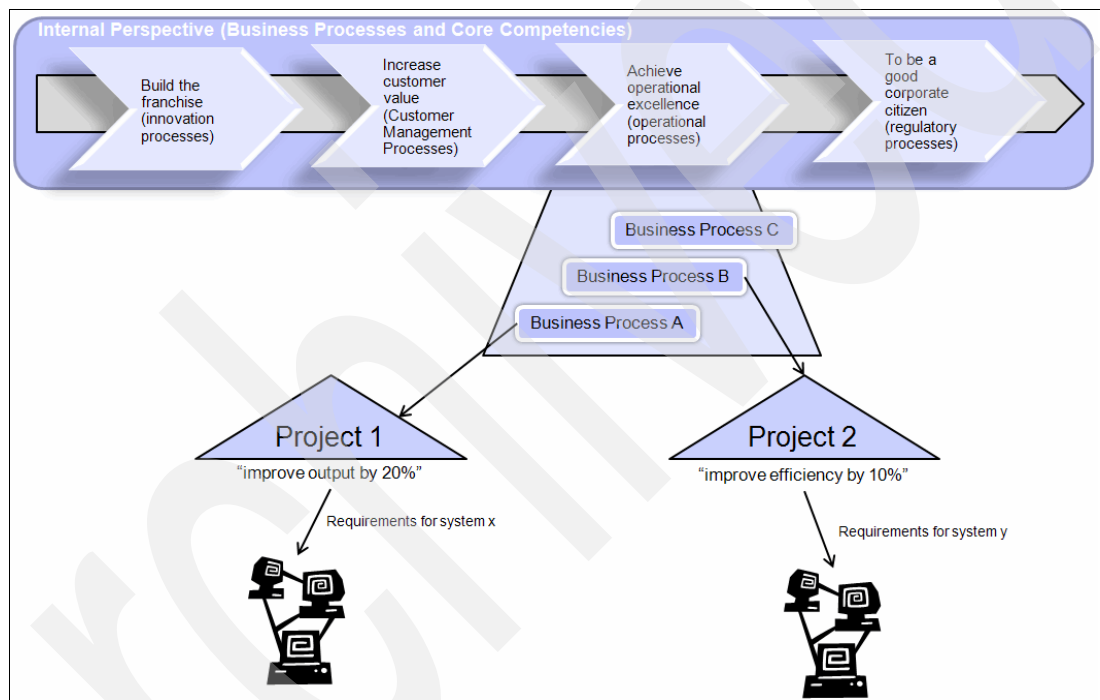
Figure 2-17   Connecting project-level measurements to business-performance measurements[18]

[18] Adapted from *The Strategy-Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment* by Robert S. Kaplan and David P. Porter, Harvard Business School Press. Copyright © 2001 by the HBS Publishing Corporation. All rights reserved.

A measure-up example

Figure 2-17 on page 49 illustrates a simple example of connecting project-level measurements to business performance measurements. Projects 1 and 2 are associated with Business Processes A and B, respectively. Each of these projects are thus strategically aligned to delivery business value in the context of these two business processes. In turn, these business processes are aligned with a company-wide "operational excellence" initiative as indicated on a scorecard (organizational or company wide).

In this case, the company has determined that achieving operational excellence translates into increased customer sales, satisfaction, or both resulting in increased revenues. The quantification of the business value was analyzed prior to allocation of resources for both projects. As a result, these projects have been constrained to deliver results that conform to a (high level) set of measurable criteria (for example, to improve output by 20%), which results in the identification of specific requirements for system x.

Measurement Point	Measurement Aspect	Explanation
1- Process	Efficiency	Resources consumed in the process relative to minimum possible levels
2- Output	Effectiveness	Ability of a process to deliver products or services according to specifications
3- Outcome	Product/service effectiveness and customer satisfaction	Ability of outputs to satisfy the needs of customers

This process Model shows where to find each type of measurement.

From Process Redesign: The Implementation Guide for Managers, by Arthur R. Tenner and Irving J. DeToro, 1996.

Figure 2-18   Concept - Measuring process performance[19]

Figure 2-19 illustrates a concrete example of connecting project-level capability improvements to business performance criteria. In this example, software development project-level capability improvements are strategically aligned with business performance criteria. Although this example is somewhat simplified, it contains important concepts that demonstrate how you can successfully relate project-level measurements to higher-level initiatives.
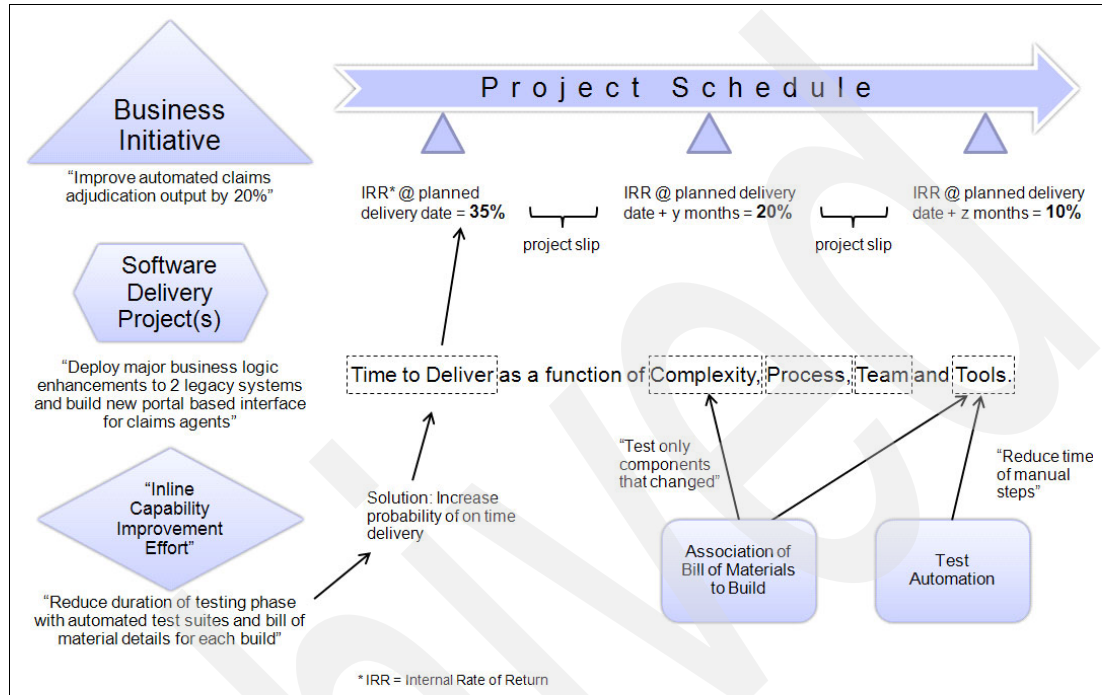
Figure 2-19   Example of a business initiative driving IT capability improvements

The example shown in Figure 2-19 goes through the following stages:

1. The business initiative

   The business has a goal of improving the automated (insurance) claims adjudication output by 20%. This increased output translates into some amount of increased revenue for the business (not shown in the example).

   However, this initiative has a shelf life. Due to federal insurance regulations that drive business, the solution must be instituted within "z" (a number of) months. Otherwise, the rate of return for the investment will drop to below 10%, which is no longer competitive with other business initiatives. That is, it is not worth the investment if the IRR is at or below 10%.

2. The business solution

   Through a strategic planning process, including the development of aligned scorecards that pull in business initiatives to align with IT initiatives, management has determined that the company must enhance two existing systems. The new business logic added to these two systems will result in a reduction in the total number of transaction processing steps for claims adjudication of each transaction. This reduces the total amount of time to complete a claims adjudication by at least 20% as specified by the business requirements.

   Additionally, in order to expose this new capability to their claims agents, management has determined that a new portal-based interface must be deployed. These system changes define the need to create several software delivery projects.

3. Addressing project team capability

   For each of the software delivery projects for this business initiative, the teams understand that getting a solution in place quickly is critical for the business. They know that slipping project schedules reduces the return on the business investment (IRR) and that a schedule slip beyond "z" months is likely to result in project cancellation. The director who manages these software delivery projects knows that delivery on the proposed schedule will be a challenge. Although they met their ROI criteria, the last few projects slipped more than "z" months, and the relative complexity of those projects was not significantly different from these new projects.

   As a result, the director requires each project team to develop changes to their software development approach that increase the probability of on-time delivery. Regardless of the solution for capability improvement, it must be identified quickly and executed in flight. The schedule does not allow any time to stop and re-tool.

4. Improving on-time software delivery

   Each project team works with the company CoE of the software development life cycle to jointly and rapidly identify areas for improvement. After brainstorming and consultation with their consulting partner, the CoE (in a joint decision with the project teams) determines that they must address the test and deployment disciplines of their software development life cycle. They have recognized that the delivery of their solution must be of the highest quality. Some 2500 claims agents will use this new capability, and failures (for example, down time) in the field will erode the businesses ROI. As a result, testing of the new capabilities cannot be compromised.

   The teams know that testing takes a long time because their testing processes are manually conducted by QA practitioners. In addition, they require that the whole system be re-tested each time. Although they have well-architected, encapsulated modules of behavior, they do not understand where changes have been made, relative to system tests, in order to target execution of only those tests for the new capabilities.

   Therefore, the project teams decide that they must increase the probability of delivering their solution on time by performing the following tasks:

   – They must execute only those tests that test new or changed capabilities.

   – They must automate test procedures to reduce the total amount of time it takes to assess system quality.

   > **Time to deliver versus system complexity:** As illustrated in Figure 2-19 on page 51, the time to deliver new or changed system capabilities is a function of system complexity, the process used to affect the changes, the skills of the practitioners who are making the changes, and the tooling that is available to automate work. This is a simplification of the COCOMO II cost estimation model.[a]
   >
   > In this example, the capability of the project team to test only those components that changed is related to two of the four variables, which are complexity and tools, that define the team's ability to deliver on time. In addition, the reduction in test time through test automation is related to the tools variable.

   a. Royce, Walker. "Improving Software Development Economics, Part I: Current Trends." *The Rational Edge*. IBM Corporation, April 2001.

In this example, we demonstrated how project-level capability improvements can successfully relate to business performance criteria. One of the keys to establish this measure-up connection is business transparency. The project team and CoE of the software development life cycle of the organization are both aware of the critical business performance criteria upon which their decisions must be made. The capability improvement effort is not tied to generic

ideas that the organization must improve its productivity or skill level. The effort is tied to specific business initiatives that generate a strategic advantage for the business. This strategically aligned information must be understood at all levels of your organization. Your IT governance solution is the enabler for this level of exceptional business execution.

2.7 IT governance control strategies

Organizations place constraints on business processes in order to minimize the likelihood of project failure. These constraints are often implemented as a collection of procedural controls that are likely to increase product quality and conformance to regulation, standards, and policies. They are also likely to ensure that project contribution and associated initiatives remain inline with the strategic objectives of the business. In this section, we discuss management strategies of IT governance via the application of automated business process control points.

High trust and high security
A continuum exists that begins with small uncontrolled projects and extends to include large projects that require a high degree of control. To illustrate this range of operational tolerance, we use the control quadrants shown in Figure 2-20 on page 53. In this section, we look at two common relevant considerations, namely security and process, that are related to the need for control.
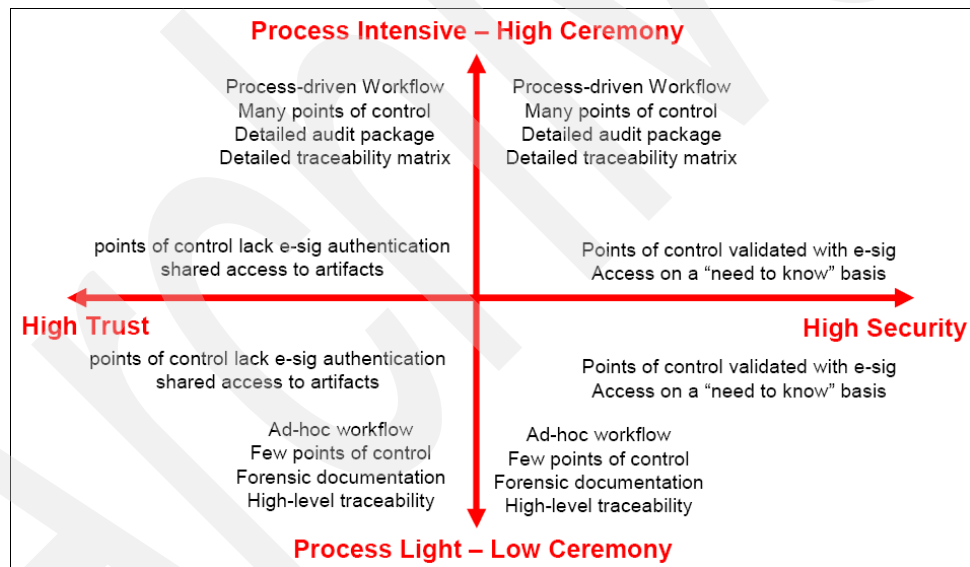
Figure 2-20   Control quadrant - Finding the right level of control for your organization

In Figure 2-20, movement from left to right takes you from high trust environments, where security constraints are low, to environments where security and data integrity are a major concern:

► In high security environments, a requirement for the use of an e-signature to implement points of control for non-repudiation of data may be an unavoidable requirement.

► In less formal environments where there is no need for such non-repudiation requirements, having developers check their code might be enough.

High and low ceremony

Movement along the vertical axis from bottom to top illustrates the need for organizations to formalize the documentation and execution of their processes:

▶ *Low ceremony organizations* are typically those with a small number of members where communication is easily facilitated.

▶ *High ceremony organizations* usually consist of large-scale teams, often geographically distributed. In these conditions, implementation of strict adherence to process ceremony is encouraged and enforced. In such conditions, it is often difficult for all members of the team to communicate regularly. Consequently, the institution of formalized and ceremonious processes ensures that product quality is high through the use of formalized process-based checks and balances. In this way, high ceremony processes protect stakeholders, but increase cost considerably.

Establishing your organizational position

When evaluating the amount of control that your organization demands, consider that most regulated organizations typically seek to implement a set of consistent best practices across the organization. They also seek to produce the appropriate number of deliverables or work products mandated by a given target standard.

Two considerations facilitate the impact on the business. First, the implementation of a consistent process ensures that several fundamental metrics may be shared for both lightly and highly controlled projects. In this way, the organization can compare organizational metrics for effectiveness, productivity, alignment with business goals, and so on.

Second, consistency provides greater flexibility regarding the use of resources within your organization. Because the process is consistent, your company can transfer development resources more easily from one project to another with minimal disruption. This adds to the overall productivity of the organization.

General strategy

After a company has determined in which quadrant its capabilities currently lie, it is necessary to determine the strategy to be followed to address a software development process in need of change. One possible approach to implement a compliant software development process is based on the five-step flow of activities shown in Figure 2-21.
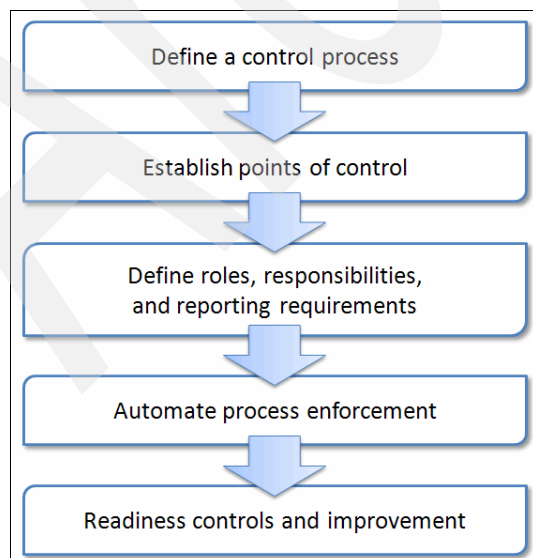
Figure 2-21   Practical control strategy steps

Define a control process

Although the key questions we present are applicable to a wide range of IT projects, for this discussion, we reference the life-cycle processes of software development for which controls are to be defined. Current best practices for the orchestration of software development activities should include accounting for the management of releases of software products. This requirement is closely followed by the requirement for the management of change requests, which in turn, is linked to releases for scheduling, development coordination, and deployment.

You may find the following questions to be useful in defining controls for software development processes:

► Key *software project* questions:

 – How do projects get approved and funded?
 – Who is authorized to access project assets at each stage?
 – What authorizations are required, by whom, and when?
 – What are project audit trail requirements?
 – What are the project documentation (reporting) requirements?
 – Where are the project packages stored and for how long?

► Key *software change* questions:

 – How do software changes get approved?
 – Who is authorized to access project assets?
 – What approvals are required, where, and by whom?
 – What are audit package requirements?
 – Where is the change package stored and for how long?

Assign roles, responsibilities, and reporting requirements

One of the most natural mechanisms for the selection of roles and responsibilities is to lift the existing procedures and automate them. Quite naturally, organizational boundary crossing dictates the roles for which implicit authorities are granted. However, recognition of the need to bypass these conditions should be accounted for and built into the workflow. A robust audit trail will exist if the actions that are executed by the backup are deemed inadequate or inappropriate. Use of existing documented processes reduces the need for additional training and increases the likelihood of success by accelerating process adoption due to a reduced learning curve.

Establish points of control in the flow

After the control process is defined, you must determine where constraints on the workflow are required to introduce points of control. In order to impose the necessary business and technical controls, constraints are typically implemented through the use of electronic sign-off or re-authentication.

These control points are related to the satisfaction of quality conditions on the work products that are being produced throughout the process. However, these control points may also be established in response to the need for accountability when crossing organizational boundaries or technical domains. Such conditions may include the following examples:

► Movement of executables from the development environment to a quality assurance environment

► Sanctioning of a given software architectural construct by the architectural team

Manage control using tool directed behavior

One key to demonstrating control over your process is *traceability*. Demonstration of control, from a traceability perspective, requires linkages from the regulation to the business policies, to application requirements, to the project plans, to business process changes, and to application changes. All aspects must be under change control. To accomplish this, your governance solution must provide a complete infrastructure that is automated and integrated across the IT process life cycle. In addition, the business and technology controls required must be implemented in a non-intrusive manner.

An end-to-end automated and integrated solution sets the foundation for a repeatable process that, together with tool-directed behavior, provides the traceability required. Process enforcement provided through tooling ensures process conformance by practitioners. It also ensures that measurement data is accurate across all participating projects. Due to the transparency of this approach, managers and executives are now empowered to make more effective decisions based upon near real-time project data.

Having end-to-end automated traceability is a powerful tool in the enforcement of your control objectives of your governance solution, but this is just one benefit of such a solution. The following key capabilities of the IBM product solution make it possible to gather the proof necessary to enforce control objectives:

- ► Life-cycle requirements for traceability to help auditors verify that compliance requirements were accurately captured and implemented in key applications
- ► Auditable workflow management capabilities that help ensure and document that all changes were made by authorized personnel for valid business reasons
- ► Flexible metrics and reporting, electronic signature, and audit trail capabilities that can be tailored to the exact processes and IT controls that govern your environment
- ► Verifiable software builds to help ensure and document that the software that was developed was deployed
- ► Automated deployment that is fully integrated into the development process
- ► Continuous validation of compliance mandates through integrated test management
- ► Tool-directed behavior with appropriate product and process quality metrics management
- ► A fully integrated process and product audit console solution for the process and development artifacts

The three points of control strategy

The three points of control strategy, developed by IBM Rational, is a practical strategy that incorporates much of the necessary infrastructure. Although primarily focused on the configuration and change management realms, this strategy provides an excellent reference for customers who are looking to instrument appropriate checks and balances over the management of process-produced artifacts and work products.

The strategy employs four types of records, each implementing their own workflow:

- ► Release record

  The release record is used for the management of target build activity that is intended for release to production at some future date, ultimately transitioning to production after all change requests have been completed.

- ► Change request

  A change request is a child record to a release and serves to track related activities that must be completed together to support some delivered functionality. For example, a particular application may have both a browser and a Microsoft® Windows® client.

However, a change request is not considered complete until the functionality has been implemented for both interface types.

► Activity record

The activity record gives team leaders and release managers the ability to assign related, but dissimilar tasks to different developers, while tracking the delivery of functionality through the change request record. For example, activities should be used through an integration with the source code configuration management repository. Therefore, all source code modifications for each activity are linked to all versions of source code that are modified to implement a feature or application fix.

► Deployment record

The deployment record type is used to manage the movement of built artifacts (software applications, staged hardware, and so on) from one operational environment to the next. One example of such a movement is the approval for movement of source code from the development environment to the quality assurance build area on a certified build machine. Your organizational procedures may be different, perhaps permitting a copy operation of built bits from the development environment into the quality assurance area.

The three control points, which are deliver change, register derived objects, and deploy objects, are illustrated in Figure 2-22 on page 57 and explained in the following subsections.
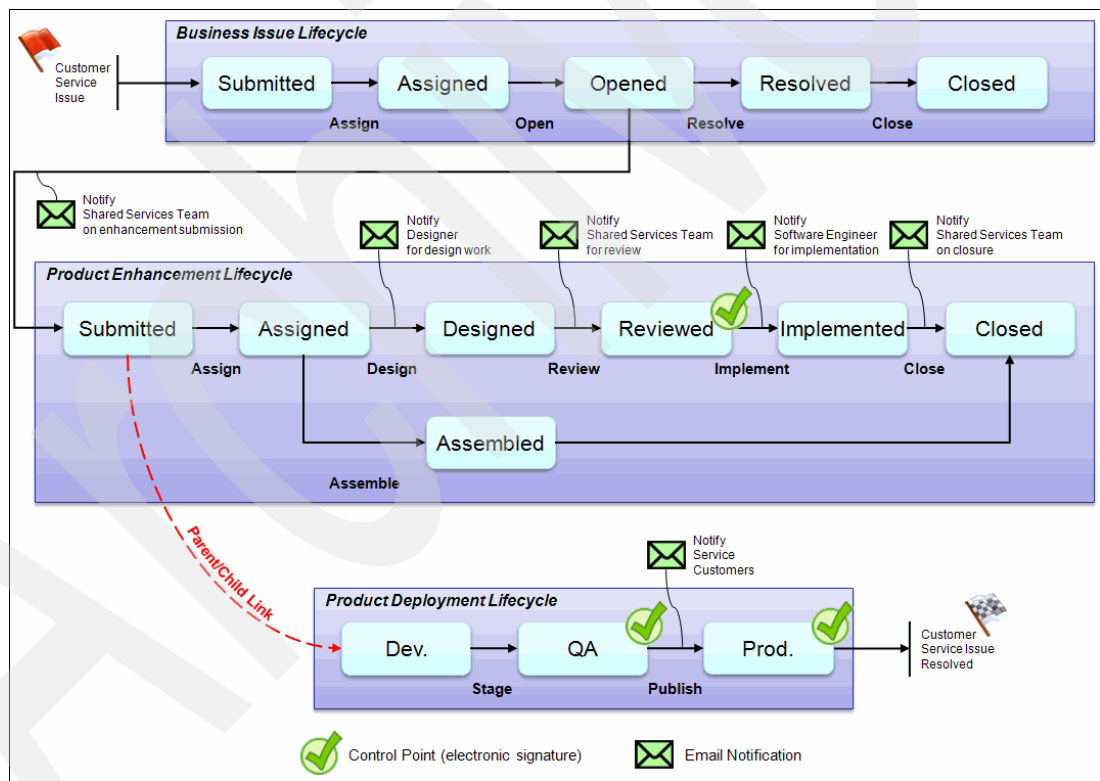
Figure 2-22   Three points of control strategy

Control point 1: Deliver change

The first control point, deliver change, manages the incorporation of individual changes that are associated with an activity into an integration environment. During this control point, the implementer posts activities for approval by the technical lead.

The technical lead can either approve the activity to allow the incorporation of change, or they can disapprove the activity, sending the changes back to the implementer for rework. After the

activity has been approved, no additional changes are allowed to be made to the change set associated with the activity.

Control point 2: Register derived objects

The second control point, register derived objects, manages the addition of deliverable objects to a controlled environment, such as a source code repository or access controlled data center. This control point occurs after development-level integration testing is complete and captures the build results targeted for quality assurance (QA) testing. Only the integrator has the authority to register build objects for QA.

Control point 3: Deploy objects

The third control point, deploy objects, manages the deployment of objects to QA and production environments. After a registered object is ready for QA or production, this control point verifies that the work included in the release is complete and the build was performed in a controlled environment. Only the release manager has the authority to approve a deployment to QA or production.

Roles and responsibilities in the three points of control strategy

Table 2-4 summarizes the roles and responsibilities in the three points of control strategy.

Table 2-4   Roles and responsibilities in the three points of control strategy

Role	Description	Responsibility
Project manager	Plans and manages product releases from request for change through the development and distribution process. Sometimes known as the *release manager*.	Owns the release package. Creates and assigns change requests to the appropriate application teams. Also approves releases to production environments.
Technical lead	Guides and oversees the development of system components.	Ensures that all configuration items are included for the system to function in a test or production environment. Acts as the primary change approver. Creates and assigns change management activities.
Integrator	Creates and maintains all steps that are necessary to build a system for use. Performs controlled builds for one or more systems.	Creates deployable objects and the appropriate deployable baselines.
Release manager	Deploys configuration items from controlled sources to the various environments used for test or into production itself.	Creates and executes the deployment instructions for a system.
Tester	A representative from the quality organization who is responsible for verification of one or more systems.	Controls the approval or rejection of a release package in the appropriate quality states. Approval is required before any release package can be moved into a production environment.
Implementer	Participates in design activities and constructs, tests, and documents system configuration items.	A primary user of the solution. Is responsible for making changes to system artifacts and assuring the level of quality for those changes. Relies on the solution for revision control and workflow enforcement.

3

IT governance adoption strategy

> "However beautiful the strategy, you should occasionally look at the results."
>
> — *Winston Churchill*

In this chapter, we discuss how your organization may develop a program to facilitate the IBM IT Governance Approach (ITGA). In order to institute the IBM ITGA and your organization's specific IT governance solution developed from this approach, you require a resourced program and a strategy for execution of that program. In this chapter, we present important program information and points of strategy that you should consider while developing your approach to the IT governance adoption program.

3.1 Seven principles for implementing IT governance

In the article "Operational IT Governance," the authors Cantor and Sanders present seven principles for operationalizing IT governance.[1] We summarize the seven principles within the context of the IBM ITGA as follows:

► The Process Principle

Governance is a process that is applied to other processes that are to be governed. The IBM ITGA is a process that enables incremental design and deployment of your governance solution. The Process Principle refers to your governance solution.

► The Artifact Life-cycle Principle

The governed process artifact life cycles guide the governance solution. Your governance solution must be sufficiently flexible to be aligned with each of a number of different management life cycles such as the software development life cycle. Furthermore, each project management life cycle must exhibit some methodological approach for its solution development, such as the IBM Rational Unified Process (RUP). This methodological approach defines the kinds of artifacts that projects develop and manage. Having your governance solution enable the reduction of risk for the development of those artifacts supports this principle.

► The Risk Principle

Measures and controls must be adjusted according to the level of risk. Projects that fall under the umbrella of your IT governance solution are to be managed based on risk criteria that is associated with each project in relation to achieving specific business goals and objectives. Furthermore, we define the project risk dynamics of Innovation, Agile Execution, and Cost Efficient that help prepare and align the effectiveness of your governance solution.

► The Suitability Principle

The needs of the organization determine how the level and style of governance will be tailored. It is important to right size or tailor your governance solution to address specific project needs. Your organization needs to thoughtfully consider the characteristics of projects (or program initiatives) to determine the right governance approach or the level of tailoring necessary to meet strategic business objectives while adhering to regulations, standards, and policies.

► The Behavior Principle

The governance solution drives the organizational behavior. Your IT governance solution is reflective of (if it is not directly) your company's execution strategy. The behavior of your organization is entangled with your IT governance solution. Your solution strategically aligns and creates transparency among multiple projects and organizational units. Access to near real-time project, initiative, and organizational data and the decision processes that result are determined by the design and implementation of your IT governance solution.

► The Deployment Principle

The governance solution must be implemented incrementally. The IBM ITGA outlines activities that detail the planning and initiation of an organization transformation approach to support the implementation of a governance solution. The approach that is described by these activities is based on the IBM Rational Development Organization Transformation (DOT) framework, which is incremental and iterative. In this chapter, we provide guidance for organizations that are attempting to develop and adopt IT governance solutions. We also discuss the vital role of the organization's and individual's ability to absorb change.

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[1] Cantor, Murray and Sanders, John D. "Operational IT Governance." *The Rational Edge*. IBM Corporation, 2007.

► The Automation Principle

Technology makes the governance solution empowering and unobtrusive. The application of automated tools as business enablers and acclerators for your governance solution is evident. Pragmatically, your organization is likely to deploy a relatively small governance team, such as your Governance Center of Excellence (CoE). Alternatively, if you are part of a small organization, a one-person team must scale to meet the needs of your entire enterprise. We offer some insight into how to accomplish this through the use of effective mentoring, as explained in "Scales of change" on page 69, and through rigorous application of IBM software products.

> **Tip:** For more details about the IBM ITGA and IBM software products to support your governance solution, review the additional materials that accompany this book. You can download those materials as explained in Appendix A, "Additional material" on page 105.

3.2 Challenges for implementation

All levels of your business are impacted by the adoption of a changed IT governance solution. It is not something that some projects or some organizations do or even that IT does. To be effective at enabling the business to manage risk transparently, and to deliver results aligned with business strategic goals and objectives, your business must subscribe to change at all levels. Change as a result of the IT governance solution will affect top executives to the recent college hires, and the most strategically aligned business units to the support organizations that enable technologies for the business.

> **Tip:** IT governance is about the whole organization, not just the IT department.

Table 3-1 highlights some of the challenges for the implementation of changes to IT governance at all levels of business.

Table 3-1   Challenges for IT governance implementation

Business level	Challenges
Enterprise and organizational levels	► Sense of increased oversight and review ► Need for additional staff to support the solution ► Changes to the organizational structure
Project level	► Added documentation or artifacts ► Iterative approach to complete activities, not the use of serial (waterfall) or ad-hoc methods ► Level of planning detail that evolves during the life cycle as opposed to doing all planning up front
Individuals	► More control and process ► New roles ► New skills

Your governance solution establishes a roadmap that guides your projects to successful completion in terms of being strategically aligned with your business and in accordance with established policies and procedures. In addition, execution of your governance solution must verify whether you have selected the right projects and that those projects offer real business value in the large sense. For example, software development and delivery projects will adopt a software development life cycle model, such as a variant of the RUP, as their preferred

life-cycle delivery method. Your governance solution must be aligned with the software development life cycle, but it is not the software development life cycle.

Jim Collins, in his book *Good to Great*, explains setting the right balance of control and authority by using the analogy of an air traffic control (ATC) system.[2] As airplanes take off and land, a tremendous amount of control exists over which airplane can taxi where, which runway to head to, and so on. Although the pilot can control how he flies his airplane, he cannot operate it in any manner that he chooses. He must comply with ATC commands. The risk of airplanes colliding is too high to allow everyone to operate their airplane under their own accord. However, when in the air, the pilot has much more flexibility. ATC does not tell him how to respond to every wind shear. This example illustrates a governance solution in action. The pilot must comply with certain control objectives and procedures, although he has some degree of flexibility regarding how to proceed.

To continue the analogy, the increased threat of terrorism since 2001 has made it necessary to periodically change what decisions are made and by whom. New roles have been introduced that affect the governance solution as have new measurements by which the process is judged.

Appropriately applied management strategies and techniques of the governance solution mean the difference between the success and failure of that solution. These strategies and techniques ensure that the right people are empowered and given the data to make decisions at the right time.

As with other forms of systems or organizational development, specifically requirements management, it is not possible to know everything up front. Assumptions made in the definition of your developed governance solution will be uncovered as project teams execute within the solution in real-world settings. It is vital to your organization that any assumptions do not introduce business inhibitors, thwarting the ability of a project to deliver critical business value. The objective of your governance solution team during implementation must be to discover any deficiencies in the solution and provide a degree of inline governance flexibility that enables the delivery of strategic business value.

3.2.1 Implementation priorities

An IT governance enablement program must meet the needs of project teams (a bottom-up analysis) and the needs of non-IT business stakeholders (a top-down analysis). Project teams generally seek a governance solution that enables them to easily meet cost and schedule guidance while achieving the desired level of quality. The difficulty is that these parameters of execution at the project level are not easily related to, or directly aligned with, the larger business initiative. Project team execution in isolation of the business initiative injects inherent risk into the business. The team should ask: Who is making sure that the project is aligned to deliver strategic business value? Are the project resources commensurate with the business opportunity?

Governance solution stakeholder needs may result in requirements or recommendations that more closely align project team execution parameters with measured business value. Such needs should be prioritized higher than those that do not provide this alignment. You should be able to develop a deeper understanding of the causal relationship between project team practitioner activities and delivered and measurable business value. If you can do this, then you will have more control over your business. It will also become easier to understand those items that add to or detract from meeting business goals and objectives, which is (IT) business risk reduction. You can use a value stream map (see "Value stream analysis" on page 85) to aid in your ability to discover these relationships.

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[2] Collins, Jim. *Good to Great.* Harper Collins Publishers, Inc., 2001. p. 124.

Prioritize governance solution needs higher for enhancements that create *measurable visibility* into the cause and effect relationship between project team execution and the delivery of business value:

► The ability to increase the capability of your enterprise architecture
► The relationships of inter-dependant projects
► The relationships of inter-dependant organizational units
► The adherence to regulations, standards, and policies

From the business stakeholder perspective (top-down analysis), you must ensure that prioritized needs do not tend to control or constrain the freedom and creativity of project teams in meeting business requirements. Business stakeholders often view IT organizations as black holes of activity. There appears to be little relationship between requests made to IT and what IT actually delivers. By enabling greater visibility into how IT works, your governance solution will serve both the business stakeholders and project teams in the following ways:

► Level setting expectations
► Developing a greater degree of business transparency
► Subsequently reducing overall business risk

Prioritization is an important step in the enablement process. It provides an opportunity to ensure that the need for governance solution change is aligned from the bottom (project team) and the top (business stakeholder). We recommend that you use the following guidance for needs prioritization of your IT governance solution:

► Create business transparency. Allow project teams to understand the business value that they produce in their context. In addition, allow business stakeholders to understand how project teams and (enterprise) architectures are aligned to deliver value.

► Do not take on too much change at one time. Be realistic about what you can accomplish with a given set of resources.

3.3 Organization transformation strategy

Participation of your governance solution team with each governed project is a critical element that helps to ensure the proper use of and adherence to your governance solution. The governance solution should require the members of the governance solution team to work *physically* with project teams, especially during the introduction to a new or changed governance solution.

We define having *physical interaction* to mean being present, either in the same physical space or virtually present via teleconferencing or videoconferencing. It is not sufficient to document your governance solution, establish enablement channels (instructor led training, CBT, self-study, and so on), and hope that everyone gets it.

In their book *Implementing Lean Software Development: From Concept to Cash*, Mary and Tom Poppendieck explain that, "When work is handed off to colleagues, a vast amount of tacit knowledge is left behind in the mind of the originator."[3] They continue by considering that, if at each hand-off, 50% of the knowledge is left behind, then after just three hand-offs, only 12% of the knowledge is left, and after five hand-offs, only 3% of knowledge remains. Enabling your company with your governance solution requires hands-on work.

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[3] Poppendieck, Mary and Tom. *Implementing Lean Software Development: From Concept to Cash.* Addison-Wesley, 2007. p. 77.

> **Important:** A governance solution with all of the right intentions is useless if practitioners believe that it does not enable and enhance their ability to deliver strategic business value. That practitioners do not adhere to the guidance of the governance solution is a problem for the initiators of the governance solution (the Governance CoE and its business stakeholders), not for the practitioner.

To allow for the enablement of potentially hundreds of projects and thousands of people, you must develop the capacity to scale knowledge transfer efficiently and effectively. This kind of enablement falls within the context of organization transformation. Implementing IT governance is an enterprise organization transformation. In this section, we present a specific framework for change and discuss the application of this transformation framework to the IBM ITGA.

We describe the approach by using the IBM Rational Development Organization Transformation framework. The DOT approach assists an organization through understanding its needs and challenges related to its ability to meet the objectives and goals of the business. It starts by improving the capabilities that will drive the most value to the organization, while balancing the organization's ability to change. The communication of these improvement opportunities is in the form of *change waves*, which form a transformation roadmap.

3.3.1 Organizational transition model

To provide context for organization transformation, John Kotter presents eight steps in his book *Leading Change*.[4] This model may be a helpful reference for your governance solution team during your transformation. We briefly describe each step as follows:

1. Establish a sense of urgency.

   Begin by asking: Why are you doing this? What is the urgency? These simple questions help to establish how serious your organization is. If there is no urgency, you run the risk of wasting your time, because it will not be given the appropriate support, primarily resources and funding.

2. Create the guiding coalition.

   You must establish which people in your organization will help make this change initiative happen. Include a combination of key players from the management team, experts on the subject, and those who have credibility within the larger organization. The key people will be the Governance Change Lead and the Governance CoE.

3. Develop a vision and strategy.

   You must create a clearly articulated vision for your change program and a strategy to get there from where you are today.

4. Communicate the change vision.

   It is not sufficient to articulate the vision at a management-level meeting. It must be written down and communicated by the management team across the organization.

5. Empower broad-based action.

   For this change to be successful, the team must be empowered to make the right changes and remove any barriers. Rewards and recognition are key incentives to encourage people into this new way of working.

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[4] Kotter, John P. *Leading Change.* Harvard Business School Press, 1996.

6. Generate short-term wins.

   To get and maintain support, it is vital to attain short-term goals and build confidence in the approach. These achievements must be communicated.

7. Consolidate gains and produce more change.

   You must consolidate what is working and extend those gains to introduce more capability improvements into the organization.

8. Anchor new approaches in the culture.

   Ultimately, you must anchor the new techniques within the culture of your organization.

If a decision is made to follow this model, and not just reference it, then as you go through each step, we recommend that you rate your ability to run a change program against the elements that Kotter outlines. Think about previous transformation or change initiatives and relate what worked and what did not work against these items to aid in the implementation.

In the following sections, we discuss a few of Kotter's principles in the context of adopting the IBM ITGA, including the development and deployment of your IT governance solution.

Kotter: Developing a vision and strategy

You can use the questionnaire in Figure 3-1 on page 66 that we developed to align the strategy of your business with your need for a good IT governance solution. The objective of this questionnaire is to help you tune in to and elevate the way in which you think about IT governance and what it can accomplish for your business.

Your vision for IT governance must incorporate ideas and information about the way your business executes your business strategy. IT governance is about how you operationalize and subsequently capitalize on market opportunity. Only at the lowest levels of decomposition is IT governance about decision rights, compliance with regulations, standards, policies, among other elements. We do not minimize the extreme importance of these elements of governance. However, if your IT governance solution is primarily about being compliant and secondarily about business execution, then you are likely to not benefit strategically from your implementation of your IT governance solution. You will have missed out on the greater opportunity.

Building organizational capabilities that meet all of your goals for issues related to decision rights and compliance, but that deliver the wrong products or services at the wrong time or with poor quality, will result in a failed business. If your IT governance solution does not strategically align with the execution of your business, then with what does it align?

Thinking about business objectives and IT governance together

These questions allow you to align the way you think about the vision for your business to the way you should be thinking about what IT governance can do for your business.

The top three strategic business objectives that would benefit from a successful IT governance solution are:

_____

_____

_____

These three strategic business objectives present the following opportunities for my business (measures of ROI for specific initiatives):

_____

_____

_____

The immediate availability of a successful IT governance solution enables my business to:

_____

_____

_____

The following business inhibitors are limiting the potential of my business:

_____

_____

_____

Removal of these (prior question) business inhibitors would mean the following for my business (measures of ROI due to increased performance):

_____

_____

_____

A successful IT governance solution would:

_____

_____

_____

Figure 3-1   Thinking about business objectives and IT governance together

Kotter: Communicating the change vision

You must establish a firm base of support for organizational change. Therefore, you must educate your organization about the need for change, your vision for the end state, and the objectives to be satisfied by implementation of your IT governance solution. You must sell the vision, garner the support, and identify your champions and your detractors. You can expect

to lose roughly 15% of your staff because they are will be unwilling or unable to participate. The remaining 85% will all need to work in the same direction.

Before you begin developing your IT governance solution, you must develop and refine your vision for the future state of your organization. Although you may not have a solution or understand exactly how to go about developing or implementing a solution, you have the vision for change. Therefore you must sell your vision. Table 3-2 outlines some key characteristics of governance to help guide your thoughts as you go through the exercise of actively selling your vision.

Table 3-2   What governance is and is not

Governance is:	Governance is not:
► Outcome focused ► Enacts measures that enable informed decision making and develops organizational transparency ► Is supportive of regulations and organizational standards and policies ► The addressing and management of risk by established measures and controls	► Management ► Limiting to productivity by enacting heavy processes or business controls

Kotter: Generating short-term wins

The IBM Rational DOT framework establishes a *change wave architecture* that is specifically designed to handle the difficulties of introducing change to organizations. The change wave architecture methodologically provides the capability to create the kind of short-term wins that are necessary for the successful implementation of your IT governance solution. See 3.3.3, "Change wave architecture" on page 68, for details about this approach.

3.3.2 Dimensions of organization transformation

A development organization transformational program has two dimensions:

► Organization capabilities
► The range of adoption across projects and organizational units

The transformation program consists of overlapping waves of increasingly broad capability and widening of adoption. Figure 3-2 illustrates this concept.
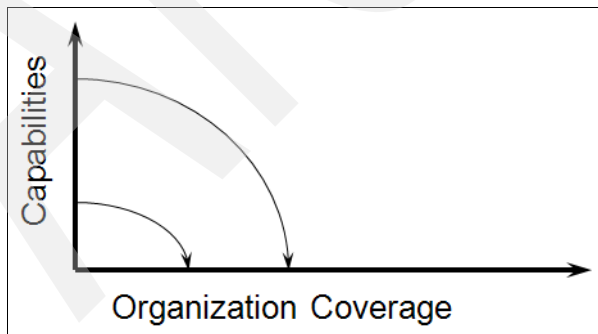
Figure 3-2   Waves of change to organize your transformation approach

3.3.3 Change wave architecture

Change wave architecture is an organizational transformation approach that is based on the incremental introduction of increasing capability. This approach especially applies to changing key business processes (altering the behavior of workers) or scaling new business processes across an enterprise.

A change wave architecture supports the following key elements (illustrated in Figure 3-3):

► Waves of change

  We refer to *packages of capability* being introduced via waves of change. Each change wave is focused on achieving particular business results, such as improving time to market.

► Change-wave initiative

  Each change wave is a change project. Furthermore, each project should have phases and milestones to help control the risks that are associated with change. Success is measured relative to technical results, such as consistently achieving planned release dates.
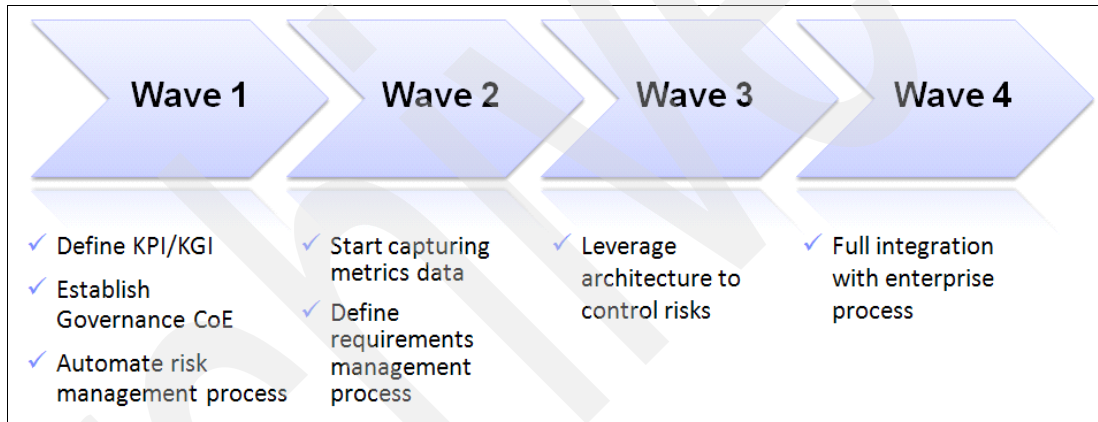
Figure 3-3 Example of waves of change for a single change-wave initiative

Maximizing productivity in transformation through change waves

The change wave architecture recognizes that projects initially may be negatively impacted by the introduction of change. Figure 3-4 illustrates this as a dip in productivity.
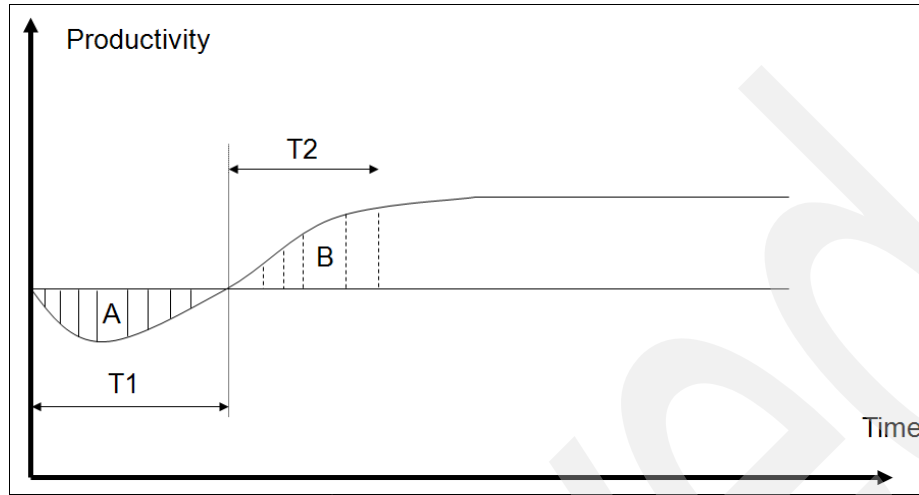
Figure 3-4   Productivity dip due to the introduction of change

The following accommodations, made through this approach, reduce the impact (depth of any productivity dip, A in Figure 3-4) and reach positive results much more quickly than by other means (T1 in Figure 3-4):

► Initially you will impact only one or two projects, so that you can refine the scope and begin to more clearly form the architectural approach for your organization.

► Subsequent to the initial projects, you will apply change waves to additional projects to help stabilize the architecture of the change solution and to package it for broader use.

► Centralized activities are required to create the supporting infrastructure for projects that are adopting change.

Scales of change

The change wave architecture is a scalable architecture. It is flexible to meet the needs of both the smallest and the largest organizations. Table 3-3 describes the characteristics of the change wave architecture for organizational efforts and smaller (including project) initiatives.

Table 3-3   Scales of change

Scale of change	Characteristics of the change wave architecture
Organizational change program	► Waves of change will drive our change efforts toward the vision. ► Each wave is focused on achieving particular business results.
Change initiative or project	► Each wave becomes a change project. ► The change project should have phases and milestones to help control the risks of change. ► Success is measured relative to technical results. ► Each change project should deliver value independently.

For example, depending on scope of the project or projects (scale), a change wave architecture may include the following sample capabilities:

► Wave 1 (one or two projects): Consistent system object methods, iteration management, common system object repository, initial collaboration environment, and initial proposal content updates

► Wave 2 (10 to 20 projects): Subcontractor shared process, common development environment, and collaboration environment integrated with subcontractor management

► Wave 3 (all projects): Full integration with enterprise processes

As your IT governance solution is adopted by more and more of your organization (measured as increased capability over more projects), your Governance CoE must also scale to meet the demand.

Your Governance CoE is composed of governance solutions experts. These experts understand both the issues of governance and the alignment of purpose and results of your IT governance solution with your business strategic objectives. During a period of IT governance solution enablement (throughout the manage phase of the IBM ITGA), your governance team must participate with each project team to ensure the effective implementation and subsequent use of your governance solution.

The CoE team, which is normally composed of a limited number of individuals, must maintain relationships with key business and IT stakeholders, as well as the sponsors of the effort. They must also scale to meet the demands of your business in terms of reaching and supporting all governed project teams. This support is largely accomplished by building and executing a mentoring program that scales suitably for your business. The CoE team also needs to actively communicate their progress and lessons learned to the Governance Change Lead and the entire organization.

The following topics of governance are likely to require mentoring support:

► Interpretation of strategic business artifacts including scorecards that define success measurement criteria

► Bridging business and IT issues with appropriate discussion and negotiation techniques, making strategically aligned decisions at the project level

► Accessibility, relevance, and applicability of company and organizational policies, regulations, and standards

► Alignment and execution of project objectives against business initiatives, aligning management processes with IT governance processes

Enabling change through mentoring

Your Governance CoE must be composed of governance solutions experts that understand both the issues of governance and that of alignment of purpose and result of your governance solution with your business strategic objectives. During a period of governance solution enablement, your governance team must participate with each project team to ensure the effective implementation and subsequent use of your governance solution.

The CoE team, which is normally composed of a limited number of individuals, must maintain relationships with key business and IT stakeholders. The team must also scale to meet the demands of your business in terms of reaching and supporting all governed project teams. This support is largely accomplished by building and executing a mentoring program that scales suitably for your business.

Instruction books can convey only so much knowledge. They cannot substitute working side-by-side with someone who has already gone through the process. Some knowledge is

not easily read and applied. A critical area of knowledge is the practical application of your governance solution. It is the manner in which you follow the rules in a certain situation within your organization or project. This kind of judgment is difficult to make without former experiences of applying governance solutions.

Typically, rules about how to follow rules are not found in your governance solution because the solution itself cannot possibly be aware of every situation that will occur at every element of your organization. Nor is it possible to express everything in words or pictures. However, a mentor with experience from many other situations and many other projects can help. They have seen the consequences of choices regarding how to apply the governance solution, which is only a portion of the value that mentors add. A mentor uses experiential knowledge to demonstrate to project team members how your governance solution can and should be adapted to achieve the strategic goals for the project in the context of the business.

While transferring knowledge, mentors must be able to share their experiences about how to use the governance solution and the supporting tools in a way that team members can understand, absorb, and apply. The concept of knowledge transfer can be somewhat misleading. It is neither easy, nor as rapid as it sounds. It must also be adjusted to the situation and to the individuals who are involved. Knowledge transfer is not a one-way transmission. Team members must take ownership for their knowledge acquisition in the form of personal learning and development, such as reading the content of the governance solution and participating in online learning and discussions. In addition, team members must provide real-time feedback to the mentors to make sure they understand the information and to offer lessons learned from their experiences.

Mentoring may occur in any of the following ways:

► Workshop leader

   Some activities are best performed in a group, such as team procedures for a release to quality assurance or production. In this example, a leader decides who makes decisions about when code is moved, who moves it, and the responsibilities of all project team members.

► Governance solution expert

   A governance solution expert provides on-site support for the project. The task of the governance solution expert is to help the project team use your governance solution as effectively as possible. If the governance solution expert detects any problems due to a lack of knowledge among the project team, the governance solution expert is responsible for filling that knowledge gap on the project team and ensuring self-sufficiency of the project team moving forward.

► Project manager support

   Sometimes the project manager has little or no experience with the governance solution. A governance solution expert can help the project manager to steer the project through the governance solution.

► Reviewer

   A cost-effective way to transfer knowledge is to have a governance solution expert review the results of each milestone. A review often reveals any problems that the members of the project team may have regarding how they use the governance solution. The reviewer does not replace any of the regular reviewers with their domain and technical expertise.

Your governance solution mentors must fit the following profile:

► Encourage people
► Constructively offer feedback
► Practice what they preach

- ► Be prepared to conduct a workshop
- ► Know your governance solution
- ► Build knowledge and skills related to the governance solution
- ► Know their limits
- ► Let project team members make mistakes
- ► Familiarity with problem solving process
- ► Be prepared to collaborate
- ► Create atmosphere of confidence
- ► Be proactive and not reactive
- ► Take joint ownership for project deliverables
- ► Keep up the speed
- ► Document best practices
- ► Capture lessons learned

A good mentor becomes dispensable because the goal is that the project will become independent of the mentors. However, it is not trivial for a mentor to become dispensable. The project may be at risk of becoming too dependent on the mentors to handle all problems and difficult tasks, rather than the project team solving them. Project resources need to be given the responsibility for taking over the mentor's tasks, especially ownership of the process. This dispensable nature of mentors allows for the Governance CoE to scale to meet the needs of the business.

3.3.4 Alignment of change waves to business initiatives

When considering the organizational transformation approach to introduce your IT governance solution, select participating projects with much forethought. You must recognize that there might be increased risk and skewed results if your IT governance solution affects only a subset of inter-dependent projects that define a larger business initiative, especially when those projects are executing concurrently. The introduction of your IT governance solution must be aligned (as appropriate for your business) with business initiatives rather than with individual projects.

3.4 IT governance and compliance

In the article "Operational IT Governance," the authors Cantor and Sanders discuss the need to consider compliance issues as you develop your governance solution:

> "In establishing governance, an organization must consider its regulatory compliance needs and put in place procedures and tooling to efficiently capture compliance records, thus enabling an organization to record and communicate the extent to which various processes are executing in compliance with business or regulatory policies".[5]

To refine your understanding further, consider the following definition of *governance*, from the white paper *Governing the business process of software and systems development* in contrast to that of conformance:

> "Governance is a process that establishes chains of responsibility, authority, and communication, to empower people, as well as the measurement and control mechanisms to enable people to carry out their roles and responsibilities."[6]

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[5] Cantor, Murray and Sanders, John D. "Operational IT Governance." *The Rational Edge*. IBM Corporation, 2007.
[6] Barnett, Liz; Cantor, Murray; and Rusting, Rachael. *Governing the business process of software and systems development*. IBM Corporation and EZ Insight Inc.

In addition, we define *compliance* as the set of deliverables, processes, and documentation necessary to satisfy a company's interpretation of a given regulation, standard, or policy.

Based on these definitions, we note that this activity is truly focused on your ability to provide evidence of proper and appropriate use of your governance solution. Furthermore, this evidence must be provided in a timely manner and with consistency both across auditor query instances and across project teams and organizational units. In addition, your governance solution must have provided your project teams the fabric from which you elicit your responses to auditor inquiry.

From an internal, company-wide perspective, it is vital that your governance solution be applied as uniformly as possible. Uniform application of your governance solution leads to the increased ability of your business to more easily comply with regulations, standards, and policies by following a smaller set of performance and procedural requirements. As a result, it supports the elimination of redundant, ambiguous, and incomplete specification within the definition of your governance solution. In addition, uniform application of your governance solution enhances the decision processes of senior and executive management.

> **Important:** The ability of senior and executive management to make critical decisions based on the contributing risk factors of multiple projects is important. Making decisions at the executive level is dependant on your ability to correlate information that is collected across many projects and typically across many lines of business. Therefore, governance solution compliance is important both operationally as well as strategically. Operationally you must be in compliance with regulations, standards, and policies. Strategically, your business must operate in a manner that meets your key objectives.

To be in compliance with a regulation, standard, or policy generally means that you can substantiate that you meet both the performance and procedural requirements:

- *Performance requirements* demonstrate your ability to deliver functionality or tasks. Examples of performance requirements include producing a specific audit log or a financial report as mandated by a regulation.
- *Procedural requirements* demonstrate adherence to your documented operational process. Consider an example where employers will be responsible for appropriately validating the identity of employees.

Because many regulations do not tell companies exactly what they need to do, companies must rely on their own legal staff and risk officers to interpret regulations and reflect, adopt, or absorb their interpretation into company policy.

Ultimately, an audit is a test, which can be initiated and conducted in a variety of ways. The test can be carried out as self assessments by teams that perform self inspection or during inspections of business operations, by auditors and inspectors:

- An *auditor* is someone who is on the inside of the business or has been hired by the business to conduct the business operations inspection.
- An *inspector* is an authority from a government agency that comes to perform the business operations inspection.

In summary, your IT governance solution, relative to compliance issues, must have the following objectives:

► Show adherence to and assure implementation of all policies established at the organizational business level, generally referred to as *policy provisioning*.

► Facilitate information extraction related to the demonstration of compliance.

► Gather sufficient information to respond to internal controls and auditors demands.

► Attend to compliance cost reduction, based on best practices and supported tools.

3.4.1 Business improvement through compliance

Regulations are designed to control and make companies more accountable. They also provide an excellent opportunity to improve the business and transform it into a better run, more transparent, and ultimately more competitive company. Figure 3-5 demonstrates how companies are often initially interested only in complying with the mandates. Then they quickly recognize the opportunity for improving their processes and eventually transforming their enterprises to gain competitive advantage.
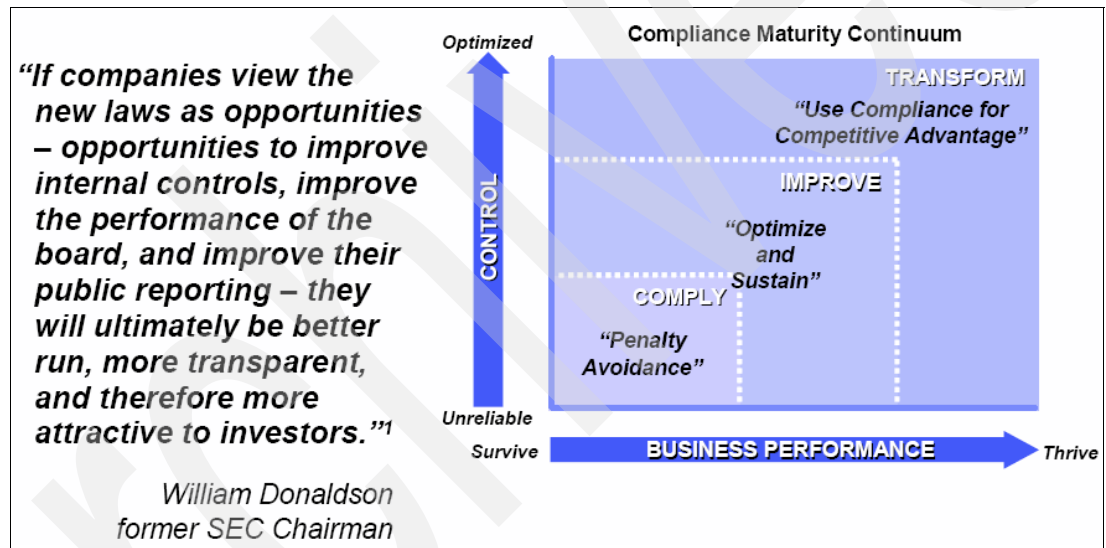
Figure 3-5   IT governance opportunity

Meeting regulatory requirements is more than an obligation. It is also an opportunity to improve an organization's transparency, oversight, and results. The implementation of a sustainable compliance architecture typically replaces ad hoc or undocumented processes with a more structured process. It can also capture the project metadata and metrics that enable organizations to realistically assess current practices of the organization and iteratively improve either the practices or their execution.

In addition, reducing compliance risk is the first step toward establishing a strategic framework for IT governance to improve visibility over IT investment. Over time, the value that good IT governance can deliver continually increases. IT organizations can start by managing risk and monitoring remediation projects. Then, by automating development workflow, companies can make the best practices operational and finally optimize their execution to enable true business transformation for the enterprise as illustrated in Figure 3-6 on page 75.

Figure 3-6   Steps for establishing IT governance

3.4.2 Challenges

Your governance solution implements compliance through a set of regulations, standards, and policies. It is a compliance initiative.

Important: In this section, although we discuss a governance solution in terms of being a compliance initiative, your IT governance solution is *not* to be placed on your business as a constraint. Governance solutions must first enable and incent good, strategically valuable, behavior. Do not confuse governance with command and control. Good governance is a business enabler not a business inhibitor.

IT governance initiatives often require changes in process and operational activities that impact the day-to-day work of the entire organization. To minimize the overhead that these changes can imply, it is important for companies to realize value from IT governance. Many companies are overwhelmed by its scope and complexity. They find it necessary to turn to consultants and outside agencies to solve their problems.

However, IT governance is an ongoing process. Companies must come to terms with it by establishing appropriate controls and automation in order to make compliance a productive and value added process. Tools that bridge the gap between the varying roles of the organization and facilitate information sharing and communication are necessary to make compliance provide benefit to its participants.

The auditability of your IT governance solution depends on your ability to institute sufficient automation for the management of key data, retrieve this data from an archive, and reconstruct key decisions that lead to the present state. Businesses that seek regulation, standard, and policy adherence have the following challenges:

► Security

   Determine who can access artifacts, whether the roles are valid, and if the employees in the roles.

► Auditability

   Determine who made changes to the artifacts, whether they are authorized, and whether they can they be tracked.

- ► Data and application access

  This refers to authorization, execution, and acceptance.

- ► Monitoring of applications in production

  This refers to operation changes or authorization and exception handling or tracking.

- ► Authorized software licenses

- ► Weak documentation and assessment of internal controls

- ► Lack of sufficient and appropriately qualified or trained resources, both at a corporate level and business unit level

- ► Content or records management and document management strategies not keeping up with heightened demands

- ► Dependence upon spreadsheets

- ► Lack of ledger audit trails, such as insufficient documentation, data inconsistency, and a lack of controls, especially on software development processes and packaged application customization processes

  An example is the lack of a process in place to track that functional requirements are implemented in the applications that automate business rules.

- ► Lagging IT infrastructure

- ► Unclear accountability structures

- ► Lack of compliance policy for the retention of key information and process controls when operating the business

- ► Limited ability to ensure proper destruction

- ► Inability to prove records were not falsified

- ► Inability to quickly and easily retrieve records upon request

- ► Inappropriate storage media for retention needs

In addition, the following examples indicate types of IT governance compliance concerns that may be expressed by management. It is important to note that this list is not exhaustive, because it will vary from one problem domain to another.

- ► How can I manage the multi-year effort required to implement the regulatory changes across all of my systems, controlling the costs, budget, delivery, functionality, and integration of all of my systems?

  This is a complex problem that requires portfolio management expertise, integrated with program and project management.

- ► How will I demonstrate a linkage between the business processes that I develop and the rules that my processes satisfy?

  Auditing specialists are continually looking for a way to tie the business back to the language of the legislation, regulations, standards, or policies. They often accomplish this through the use of a document or position paper that describes a plan for achieving compliance. The reality is that many times these documents are drafted and forgotten, particularly on initiatives that run longer than six months.

- ► How will I document my existing business processes and systems as they are implemented today?

  Certain legislation demands that executives have a full account of how the business operates. It is now necessary to document how the business operates and where the key points of control exist, as a component of any remediation effort for a business.

► Why are auditors and inspectors concerned with how we did things before we changed them?

Auditors and inspectors are also keenly interested in demonstrated control over changes to the business. They want to see that you have a process for modifying business operations and automation.

► How will I assess the compliance gap between my current business operations today and where I want to be tomorrow?

To transform the business, you must leverage the "As-Is" model of business operations into a "To-Be" model that fully complies. However, you cannot blindly construct an IT governance solution without having a rudimentary understanding of the costs of changing the business processes.

► How will I transition my automated systems from their existing implementation to a new implementation?

To achieve effective IT governance, it is often less expensive to replace an existing system than to redesign the old system to do what it was never intended to do. Gap analysis must be performed between these older systems that are being replaced and the newer systems that you may be considering. Homegrown systems that provide competitive advantage may have to be redesigned. Finally, you must reintegrate your newly selected systems to your existing systems or modify the functionality of your homegrown systems to close the loop.

► How can I demonstrate that the business processes I have employed are being adhered to as documented?

Although the executive committee defines how things are done, someone must monitor the business to ensure adherence to the new operating rules. Auditors seek evidence that the newly defined rules have been implemented. Simple implementation of appropriate measurements and metrics can easily solve this problem.

3.4.3 Audits and inspections

The guiding principle for most auditors and inspectors is to look for process exceptions. First they look at your process problems, not project data. They typically seek the following types of information:

► Documented processes for creation of all business artifacts

Your IT governance solution must have proper documentation that is easily accessible and easily followed. It must also provide practical guidance for practitioners.

► Adherence to the defined process by the artifact creators

All artifacts must have a clear creator or owner. Also evidence in the artifact audit trail must realize the IT governance solution policy.

► Linkages between supported tools using tool-directed behavior

Automated tools that are used to implement your IT governance solution regulations, standards, and policies must be connected together to provide end-to-end business benefit. Improving the productivity or accountability of single or isolated practitioners within the value-chain is insufficient. Automated tooling that links the work of individuals is a necessary accelerator.

► Process linkages to automated processes supported by tool mentors

Users of automated systems should be able to easily use those systems to execute specific business processes. Without connectivity of the process to the tooling that it

supports, your effort to document your IT governance solution and to subsequently enable the effectiveness of that solution through self-sufficiency is compromised.

► Linkage between artifacts that align with the business process steps

Your IT governance solution might sometimes specify that certain tool or data formats must be in place and used to manipulate project data. It must be clear that the specified tools were used to manipulate project data, so that the integrity of data linkages (traceability) is maintained. Misuse or nonuse of proper tooling can easily cause a disconnection in the decision process by decoupling the work of individuals, which results in the possibility of uninformed or non-causal decisions being made.

► Artifact traceability to points of accountability in the delivery chain

As practitioners in the value chain of your IT governance solution affect a change in the state of developed artifacts, the systems that are used to make those changes must record a complete audit trail of the change. They must include who made the changes, when the changes were made, and what change was made.

► Transparency of reporting

Reporting is overhead in nearly all organizations. Therefore, it must be automated to the greatest extent possible in order to minimize productivity waste. However, and more importantly for auditors, reporting should be accomplished so that information is collected objectively and transparently into a repository of knowledge. This information must be collected both without the direct interaction of practitioners and across all target organizational units or projects.

► Accountability in the chain of delivery

No steps in a projects life cycle can have ambiguity of the owner or state of any artifact.

► Non-repudiation of any artifact throughout the system

Circumvention may occur with artifacts that continuously undergo change, especially in response to practitioner hand-off, such as from development to testing.

Audit areas of focus

Although each audit can be different, auditors are likely to investigate the following areas:

► Evidence of a documented process or adherence

Inspectors often want to know that you have a documented process. In the case of an IT audit, for example, they may ask for documentation of your software development life cycle. Upon review, the auditors may request interviews with two or three people from the department that is being audited. They typically interview each person independently to determine whether their practices match both the stated documentation and other team members' practices. If the results of these interviews neither match each other nor the documented software development life cycle, it is a sign of a problem that will trigger a deeper exploration.

► Evidence of process maturity and stability

Even if the previous practices match the documentation and each other, auditors will look for corroborating evidence of process stability.

► Evidence of process compliance

Documented evidence of a formal change control board should also be demonstrated as evidence of control over the quality process mechanism, the metrics gathering mechanisms, and the applications themselves.

- Linkages between process and artifacts

  Because the approach to systems inspection tends to be by exception, an auditor or inspector will typically examine a problem artifact and request all of the related information for that problem artifact (artifact traceability). Such an examination presents a significant challenge to most businesses because the archeology necessary to locate most of these artifacts can be quite lengthy, if these artifacts can be located at all.

- Linkage between documented test results and requirements

  At a minimum, an auditor will test a demonstrated ability to show linkages between the feature requirements of a system and the test results that conclusively illustrate compliance with those feature requirements.

- Documented and formalized hand-offs and sign-offs

  Any process should include a formalized authorization procedure to establish accountability for the delivery of the system from development to quality assurance (QA), from QA to production, and ultimately to the user community at large.

For example, consider that an auditor is assessing one or more of your software development projects. Your governance solution must have enabled your project teams to simultaneously have met their strategic objectives (for delivering business value) as well as to have documented every decision that led to the development of the solution. The following questions will uncover the documentation of these decisions.

- Which compliance requirements were delivered in release *x*?
- Does the application fulfill compliance requirement *x*?
- Who signed off on this project at design and deployment?
- Who approved funding for this project?
- Which projects will reduce compliance risk?
- Which projects deliver strategic business value in terms of your enterprise architecture?
- Show the inter-dependency of projects that support the operational model.
- Can you confirm that all of the components are in the release?
- Can you confirm that the software developed was actually deployed?
- Who made changes to the manufacturing application?

Setting expectations

As you begin an audit cycle, you must bring together the IT governance solution sponsors, project team participants, and the audit team to communicate and review the purpose of the audit and the audit process. The auditors will de-mystify the audit for those participating by clarifying and level-setting everyone on the purpose of the audit and how it will be performed.

Audit interviews

Audit interviews may be performed on-site or off-site through a series of interviews, artifact reviews, and inspections of the project environment. Each interview generally includes one project team participant (the interviewee) with one or more auditors or inspectors (interviewers). Interviews are typically scheduled for short periods of time with gaps between each interview. Gaps between interviews provide time for auditors or inspectors to make notes and prepare for the next interview.

One strategy is to conduct interviews with individual interviewees, rather than groups, to allow more confidentiality, promote open communication, and avoid interviewees' answers being influenced by co-workers or managers. However, some variability is possible in interview schedules made possible by longer days, parallel interviews, interviewing small groups of similar roles, or having tighter schedules. In addition to the interview, interviewees may be asked to provide (post-interview) supplementary information.

All information that is obtained from interviews must be treated as confidential and non-attributable. That is the names of interviewees that provide information are not disclosed. In addition to the interviews, the audit team must schedule time and assess to review representative artifacts and the configuration of automated systems environments.

Audit analysis

After interviews are completed, the audit team analyzes the interview data and supplementary information to produce the initial findings and recommendations. Ambiguities in the findings may necessitate follow-up interviews or access to artifacts. For this reason, the audit team may want to perform regular client checkpoints. The checkpoint should be conducted with the audit sponsor and logistical point of contact. The focus of the checkpoint is to review progress and to modify future audit schedules and activities.

The findings must be viewed as the consensus findings of the organization's capabilities. The findings must be ranked according to their business impact and provide information about specific violations as applicable. This information should address the root cause of problems with the application of the IT governance solution.

Process exceptions

The guiding principle for most auditors and inspectors is to look for process exceptions. Auditors and inspectors will look at your process problems first, and not at the consistent data that can be easily managed.

Auditing and inspection is generally carried out by exception. Typically a problem is identified and investigation commences. When an exception occurs, auditors or inspectors will find a problem and research it more to discover as many business issues as they can in a given audit window.

When an exception is raised, inspectors look for one of the following problems:

► System design flaw
► Human error
► Malicious behavior

When do you know you have an exceptional condition versus an something else, such as an unwillingness to participate? It is important in this discussion to be clear about the definition of what is considered an exception. If your interpretation of an exception in the context of your governance solution is not well defined, then exceptions are likely to become more of the rule than an exception. Having a lower number of exceptions against your governance solution may be an indication of the maturity and applicability of the governance solution itself. This may be true only if exception data is combined with other important factors, such as project success, and business objective satisfaction criteria.

An *exception* is a condition or event that cannot be handled by a normal process. The key component of an exception is the *variance* in performance or procedure from the general rules that are defined by your governance solution. Variance is a measure of how far off track you need to go to meet project objectives and is likely difficult to measure in this context. However, there may be general rules in your governance solution that are tied closely to time lines for execution, but this is likely not the typical case. What is the right thing to do? Should you measure how close you are to meeting the general rule? Does that matter? Probably not. Let us take a closer look.

Part of the purpose of your governance solution is to ensure that the business executes in a way that meets its strategic objectives. To the greatest degree possible (without putting constraints on the organization), your governance solution provides a uniform set of rules by

which all projects must execute. This helps to ensure that projects meet expected quality measures, adhere to architectural standards, leverage company resources, and so on.

Your governance solution should incent the right behavior and provide freedom of execution to meet its objectives. It should not be a burden that requires project teams to fill out documentation correctly or completely. This "checkbox approach" removes intelligent thought while maintaining only the mechanics of the process. Therefore, an *exception* is needed when the general rules of your governance process otherwise require the project to take actions that are counter to meeting the business objectives.

Generating exceptions because of incomplete documentation or other similar, low-value contribution items is likely a waste of time and does not contribute to the existence or purpose of your governance solution. This should help you understand, and more clearly and correctly define, the kinds of rules or policies that your governance solution implements.

Exceptions and process improvement

Exceptions should not normally be considered a part of the self-improvement model for your governance solution. They should be used to maintain business continuity and adherence to policy. Exceptions are to be used when the governance solution itself is not found to be defective, but rather is inadequate in aiding the project team in meeting their strategic objectives. Your governance solution will never be able to handle, nor will you ever be able to document, all cases and paths that are required for all current and future projects. Exceptions in your governance solution should be reflective of truly exceptional needs of the project team that, if not addressed, will result in predictably failing to meet business objectives.

As an example, suppose that your governance solution contains an embedded policy that dictates certain time-frame requirements for execution, for example: "the deployment board meets every Thursday at 9 a.m." If your project must go through this board first, waiting until the next meeting might negatively impact business performance. For example, a missed delivery might equate to a loss of market opportunity. In this case, an exception may be generated that provides some relief of the board requirement. This example might be applicable for an e-commerce business entity that attempts to deploy revenue-producing capability prior to a company marketing-defined event.

When the need for an exception has been identified, a root cause analysis should be conducted that identifies why and how the exceptional condition occurred. Look through previously accepted and rejected exceptions to determine if any patterns of recurrence exist. Such patterns might suggest whether the governance solution is implementing the wrong (or ill-defined) policies or whether implementation of the governance solution is incorrect, such as projects not following your governance solution as expected.

3.5 Measuring your results

As with any effort an organization undertakes, management and stakeholders want to ensure that the successful implementation of a program delivers value to the business. This is definitely true for the implementation of your IT governance solution. A change wave approach, as described in 3.3.3, "Change wave architecture" on page 68, supports IT governance solution implementation and measurement well. Each change wave consists of one or more change initiatives, which can effectively be measured by the corresponding key performance indicators (KPIs) or key goal indicators (KGIs).

Measuring the success of your governance solution requires gaining direct visibility into the following characteristics of governed projects:

► Operational performance
► Compliance adherence
► Risk management

Obtaining accurate measurement requires direct visibility of governed projects. Direct visibility refers to first-hand interaction with governed projects. The importance of direct interaction and participation with governed projects is a key contributor to the successful use and improvement of your governance solution.

3.5.1 What you should measure

Operational performance, compliance adherence, and risk management define and predict the ability of managed IT projects to deliver on-target business value. However, to effectively understand how to measure these attributes, you must first define what you intend to measure:

► Operational performance

This attribute is composed of all of the characteristics of your organization that help to define the return on investment (ROI) of your governance solution. Thomas Pisello, in his white paper *The ROI of Enabling Software Development Governance using IBM Rational Solutions*, summarizes the following value propositions that well define the characteristics of operational performance.[7] While your IT projects may not be related to the development or delivery of software systems, these value propositions are applicable to a wide range of IT project types.

  – Manage value
  – Develop flexibility
  – Control risk and change
  – Improve team productivity and improve utilization
  – Improve project success rates
  – Improve quality
  – Improve accommodation of internal and external regulatory requirements
  – Improve velocity to market
  – Reduce training and learning costs
  – Reduce development infrastructure and operations costs
  – Reduce redundant projects and improve value through alignment

► Compliance adherence

To be in compliance generally means that you can substantiate that your organization meets both the performance and the procedural requirements of a regulation, standard, or policy.

► Risk management

Policies and procedures are used to proactively reduce project risk in a prioritized manner. Risk prioritization must consider both external and internal conditions in relation to the governed project. *External risks* are those that are outside of the direct control of the governed project and may come from your marketplace, your customers, or your business. Examples of external risks include changes in business strategic objectives or customer uncertainty. *Internal risks* are those that are within the direct control of the governed project. Examples of internal risks include project team skill availability and the unknowns associated with architectural solution uncertainties.

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[7] Pisello, Thomas. *The ROI of Enabling Software Development Governance using IBM Rational Solutions.* Alinean, Inc., August 2006.

3.5.2 Where you should measure

All IT projects should be governed and, therefore, measured. No project should be too small or ad-hoc that it should not be measured to conform with your governance solution framework.

In the article "Operational IT Governance," the authors Cantor and Sanders present seven principles for operationalizing governance.[8] Of these principles, the Suitability Principle specifies, "The needs of the organization determine how the level and style of governance will be tailored." Furthermore, Cantor and Sanders discuss that, even within a single organization, across the many processes that must be governed, the need exists to tailor the governance solution appropriately.

> **Tip:** You should measure and, therefore, govern all IT projects regardless of size and complexity, with the right-size governance solution and based on your governance solution framework.

3.5.3 How you should measure

Now that we know what and where measurements must be taken, we must understand how best to accomplish the goals of measuring results. What are the ways to obtain the kind of visibility needed to adequately assess your governance solution effectiveness?

The fact that we measure at all has implications on the kinds of results that we should expect. The *Hawthorne effect* is the initial improvement in a process of production caused by the obtrusive observation of that process.[9] The effect was first noticed in the Hawthorne plant of Western Electric. Production increased not as a consequence of actual changes in working conditions introduced by the plant's management but because management demonstrated interest in such improvements.

Regardless of the kind of governance solution put in place, the Hawthorne effect predicts that worker productivity will increase. In addition, any governance solution that is put into place, if left unmeasured, is likely to have zero net effect on organizational productivity. Even worse, the solution may result in negative productivity due to its misuse. For example, you may mistakenly use your governance solution as a management infrastructure. Doing so may shift the focus of project teams away from the delivery of value to your business or customer and toward satisfying the rigor of the governance solution itself. For example, the focus may shift toward production and management of documentation artifacts rather than source code or other produced high value items.

Your governance solution team members must participate in the use and execution of your governance solution. The following modes of interaction define how we describe governance life-cycle measurement:

► Hands-on interaction

This mode refers to direct participation of governance team members working within the governance solution life cycle. It is used to enable and lead project teams to use the right-size governance solution. It embeds the central governance team within projects rather than just reviewing or auditing compliance with corporate standards.

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[8] Cantor, Murray and Sanders, John D. "Operational IT Governance." *The Rational Edge*. IBM Corporation, 2007.
[9] Landsberger, Henry. *Hawthorne Revisited: Management and the Worker, Its Critics and Developments in Human Relations in Industry*. Cornell University Press. January 1957.

► Active experiential data collection

This mode refers to the intrusive collection of information, written and non-written, that reflects real-world use of the governance solution. The information that is collected reflects actual work performed by the project team as proven by the existence of auditable accounting of all activities and artifact production. Members of the governance team review artifacts as they are produced. They are assessed for adherence and to determine if the artifacts are achieving the goal of reducing risk and improving alignment.

► Passive experiential data collection

This mode refers to the non-intrusive collection of information that reflects real-world use of the governance solution. The information collected reflects objective measurements that are taken based on actual project team performance. As work is performed, an automated platform collects data that is rolled up to gauge the effectiveness of your IT governance solution.

3.5.4 Measurement methods

You can use many tools to aid in the evaluation of your governance solution, including project metrics data correlation, and value stream analysis.

Project metrics data correlation

Metrics data collected from projects during execution must ultimately be rolled up to the highest business level at which decisions are made for each initiative. This data may be evaluated from the following perspectives among others:

► Project discipline category

Each project includes a number or participants. Each brings special skills to the team and is typically part of a larger resource group. For example, project teams include participants with skills in the areas of project management or requirements management.

► Management life-cycle phase

Most projects operate or are managed under a management life cycle. Furthermore, the life cycle is typically decomposed into multiple phases or stages of execution.

► Historical reference

Most businesses build projects using the same sets of resources including people, technologies, and processes. The best predictor of future performance is past performance.

Consider the example of combining the evaluation of metrics from a specific project discipline during a certain phase of project execution. The metrics data might indicate that a large amount of rework activity occurred during the scope phase of a project, such as during Inception for software projects following the RUP life cycle. In this case, certain conclusions may be drawn relative to governance activity requirements, cross-project dependencies, or other factors that may inhibit the project team during that period. Ultimately a change may be required in policy or standard to streamline the operation of the project team. For example, legal barriers may be associated with working with vendors or outsourcing partners.

Furthermore, we can expand this example to include references to historically relevant projects. Then we must refine our ability to make the right decisions regarding whether a change is necessary in the governance solution, policy, or standards.

Finally, projects metrics must reflect the ability of the project team to effectively reduce risk. That risk reduction should be measured objectively and continuously. The reduction of risk to the business and project is more important than the simple completion of artifacts or

activities. Evaluation of whether produced artifacts are referenced as input for downstream activities is important and indicates the reduction in wasted effort.

Value stream analysis

Your governance solution provides the execution authority for your business strategy. The solution is implemented through your enterprise architecture, which is a combination of your organizational and technological alignment. IT governance is a macro solution and demands a complete end-to-end view of the value delivery stream.

To aid in your ability to evaluate results, we recommend that you apply a *value stream analysis approach* as at least one technique to understand how your business executes. By using this approach, you benefit from the development of an overview of all of the processes and procedures that are required by your organization to develop and deliver value, and to leverage that view for identification of causal relationships and waste.

In his book *Toyota Production System: Beyond Large Scale Production*, Taiichi Ohno sums up the Toyota Production System by saying, "All we are doing is looking at the time line from the moment a customer gives us an order to the point when we collect the cash. And we are reducing that teemingly by removing the nonvalue-added wastes."[10]

Although your governance solution does not necessarily define your time lines, it defines what needs to be accomplished on the time line in terms of adhering to regulation, standard, and policy. If those items that need to be adhered to introduce business inhibitors, then they must be addressed in order to streamline your business. For example, addressing the inhibitors will help you to remove costs, reduce time to value, and increase quality.

Mary and Tom Poppendieck, in their book *Implementing Lean Software Development: From Concept to Cash*, discuss value stream maps in the context of the software development life cycle.[11] This concept may be easily adapted to build a time line of events for the improvement of business processes. It may include all of the significant activities, reviews, and milestones that comprise your governance solution.

Figure 3-7 illustrates a simple value stream map that challenges the assumptions that each of the identified control points add real business value. Value stream maps themselves are a representation of your critical business processes, such as software development, desktop upgrades, and data center server upgrades). We refer to it in the context of improving your (operational) business process for the delivery of an improved (revenue contributing) business process.
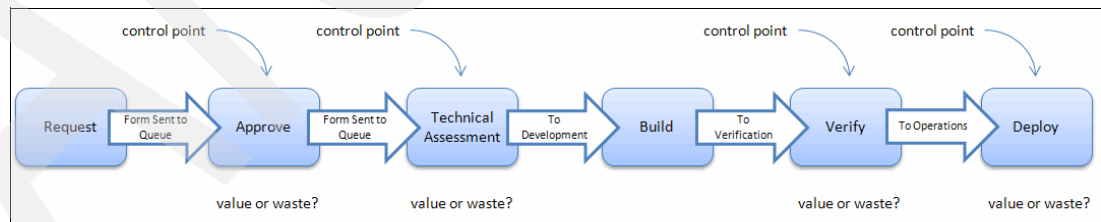
Figure 3-7   Value stream map example for software development[12]

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[10] Ohno, Taiichi. *Toyota Production System: Beyond Large Scale Production*. Productivity Press, 1988. p. 6.

[11] Poppendieck, Mary and Tom. *Implementing Lean Software Development: From Concept to Cash*. Addison-Wesley, 2007. p. 40.

[12] Ibid. p.8, Figure 4.6 contained therein. © 2007 Poppendieck LLC Reproduced by permission of Pearson Education, Inc. All rights reserved.

3.5.5 Evaluation and feedback of results

Measuring and evaluating results is about understanding and documenting the cause and effect relationship between your IT governance solution and your business goals and objectives. This relationship is a measure of whether your IT governance solution has adequately enabled your project teams to execute in accordance with your business requirements. The results measure both in terms of compliance issues, such as adherence to regulations, standard, and policy, and meeting business initiative targets, most notably schedule and cost parameters.

Evaluation of the results of the application of your IT governance solution is a critical step that requires careful attention. This activity represents an assessment of the alignment between the business strategy and IT business execution. In terms of the feedback loop of the IBM ITGA, this activity develops input (stakeholder needs) for the requirements for possible future governance solution changes. Not taking time to properly evaluate results is likely to *not* result in improved business performance.

4

The IBM IT Governance Approach

"Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity."

— *George S. Patton*

In this chapter, we discuss the business context for IT governance. We present the IBM IT Governance Approach (ITGA), which is a critical business process that ensures your business meets its strategic objectives for initiatives that depend on IT resources for execution.

Phase names: The authors of this book use of the phase names of Plan, Implement, Manage, and Assess (PIMA) for the purpose of providing context throughout the IBM ITGA. We recommend that you use this same terminology in your approach.

4.1 Overview of the approach

The IBM ITGA is an iterative approach to planning, designing, implementing, deploying, monitoring, controlling, and changing the operational processes of business operations that rely on information technology. This approach provides your company a comprehensive, repeatable, and predictable life-cycle business process for the development, adoption, and continual improvement of your IT governance solution. It provides all of the concepts, activities, artifacts, roles, and associated relationships among these elements that you would expect from the definition of a robust business process.

The IBM ITGA presents and discusses the critical characteristics of IT governance solutions For example, it addresses the solution's relationship to project risk dynamics, strength of governance, and value interests. Although the approach does not present any specific design or framework for your IT governance solution, in Chapter 2, "IT governance solution strategy" on page 15, we discuss a strategic approach that should be useful for getting started.

The IBM ITGA is an iterative approach to planning, designing, implementing, deploying, monitoring, controlling, and changing the operational processes of business operations that rely on IT. Figure 4-1 illustrates the structure of the IBM ITGA over time and by discipline. A baseline IT governance solution is developed and deployed through the four life-cycle phases: Plan, Implement, Manage, and Assess. The area under the curve that is associated with each discipline illustrates the relative amount of effort and activity required to define and deploy an IT governance solution.
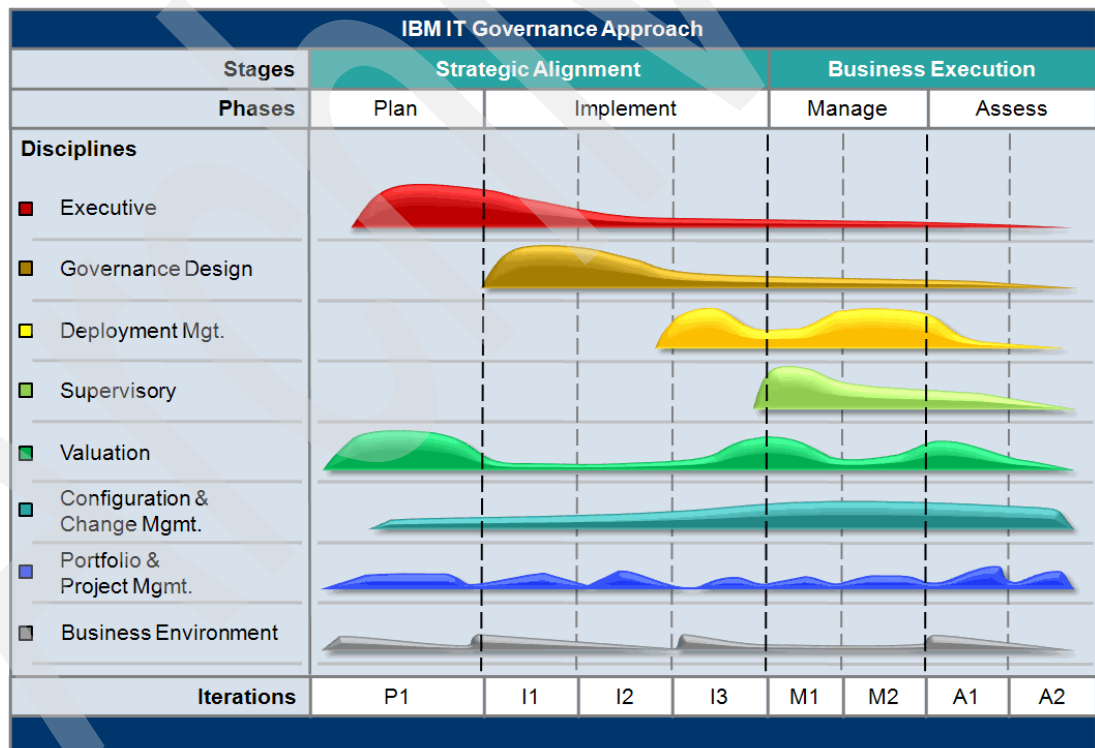
Figure 4-1   The IBM IT Governance Approach

4.1.1 Vision and value

The IBM ITGA offers your business a market advantage by ensuring that your business executes its strategy with measurable result. It accomplishes this through execution of a formal, iterative life-cycle process that integrates and aligns business strategy and business execution across your entire company.

Your vision for IT governance must incorporate ideas and information about the way you *execute your business strategy*. It is about how you operationalize and subsequently capitalize on market opportunity. Only at the lowest levels of decomposition is IT governance about decision rights, compliance with regulations, standards, and policies. While we do not minimize the extreme importance of these elements for IT governance, we assert that if your IT governance solution is primarily about being compliant, and secondarily about business execution, then you are likely to not benefit strategically from your implementation. You will have missed out on the larger opportunity that IT governance offers.

Furthermore, IT governance is not only about IT nor does it fit neatly inside the IT organization. Rather it spills over into and affects nearly all aspects of your business. IT development and operations are wholly reliant on their business stakeholders to deliver strategic business value.

> **Tip:** IT governance is about the whole organization, not just IT.

Building organizational capabilities that meet all of your goals for issues related to decision rights and compliance but one that delivers the wrong products, services, or both, at the wrong time, or with poor quality will result in a failed business. If it is not your IT governance solution that strategically aligns the execution of your business (where the business is leveraging IT), then what does?

Effective IT governance offers your business the freedom and opportunity to execute and innovate within a given set of *business constraints*. You must do this with the greatest possible degree of business integrity, coupled with the leverage (exploitation) of business processes, skills, partners, and technologies, which generally is your enterprise architecture.

> **Business constraints:** In the context of IT governance, business constraints are typically manifested as regulations, standards, and policies. However, we must also include the limitations of available capital, technologies, and skills.

How do you manage and measure the effectiveness of your IT governance solution for your business? This is the core value proposition for the IBM ITGA.

4.1.2 Principles

The IBM ITGA borrows heavily from ideas found in General Systems Theory and in Software Engineering and most notably from the IBM Rational Unified Process (RUP). Although there is no one-to-one alignment between the practices of the IBM ITGA and RUP, the similarities are in both the structure and underlying approach to the methods development and implementation.

For those who are familiar with RUP, this approach to address the challenges of IT governance should seem relatively familiar. Through the application of structured methods, your company can design and implement an integrated approach for IT governance that enables a robust enterprise architecture and that is aligned well with your company's operating model.

The IBM ITGA is a robust, proven, engineering-oriented approach that applies the following principles:[1]

► Adapt the process.

 Scale your governance solution to be effective for the business, organizational unit, or project.

► Balance competing stakeholder priorities.

 Understand the requirements, goals, and objectives of the business, and adjust priorities accordingly.

► Collaborate across teams.

 Establish organizational transparency. Harmonize the efforts of the whole business for a collaborative effort.

► Demonstrate value iteratively.

 Attack major business, programmatic, and technical risks first. Enable feedback for improvement by delivering incremental value in each iteration.

► Elevate the level of abstraction.

 Reuse existing assets, reduce the amount of human-generated output through higher-order tools and languages, and architect for resilience, quality, understandability, and complexity control.

► Focus continuously on quality.

 Ensuring high quality requires that the entire team owns quality. It involves all team members and all parts of the governance life cycle.

In their book *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*, Robertson, Ross, and Weill state that high performance companies "have embedded technology in their processes so (that) they can efficiently and reliably execute the core operations of the company." They add, "These companies have made tough decisions about what operations they must execute well and (have) implemented the IT systems they need to digitize those operations. They have made IT an asset rather than a liability and have created a foundation for business agility."[2]

The IBM ITGA is a critical business process that lies within the core operations of your company. To the greatest extent possible, this process should be inserted and embedded into your business to ensure that strategically aligned business value is consistently and predictably delivered by your IT organization. Your business relies on execution by your employees, which in turn, rely on IT governance. At the heart of executing the right IT governance solution is the IBM ITGA.

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[1] Adapted from Kroll, Per and Royce, Walker. "Key Principles for Business Driven Development." *The Rational Edge*. IBM Corporation, October 15, 2007.

[2] Robertson, David C., Jeanne W. Ross, and Peter Weill. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution.* Harvard Business School Publishing, 2006. p. 2.

4.1.3 Structure

The IBM ITGA is defined by both its static structure and dynamic structure.

> **Tip:** For more details about the IBM ITGA, see the additional materials that are provided with this book. You can download them as explained in Appendix A, "Additional material" on page 105. In addition, you can find the plug-in on the Rational Method Composer Web page at the following address:
>
> http://www-306.ibm.com/software/awdtools/rmc/library/

Static structure

The static structure of the IBM ITGA represents the underlying architecture of the method. This architecture defines a life-cycle business process and describes the high-level objectives that, when accomplished through execution of the life cycle, result in the delivery of a high value IT governance solution into the business.

The IBM ITGA is organized at its highest level into two distinct *stages*: the Strategic Alignment stage and the Business Execution stage. Each of these stages are then segregated into two milestones, each for a total of four milestones across the entire life cycle. The periods that bridge milestones (or that are bound by the start of the life cycle) are defined as *phases*. The life cycle has a total of four phases. Each phase precedes and culminates at a life-cycle milestone. Figure 4-1 on page 88 illustrates the static structure of the IBM ITGA as noted by the four phases.

The static structure of the IBM ITGA is designed to keep your business focused on the four major milestones of the life cycle. Meeting each milestone objective in a measurable way will result in predictable delivery of the right IT governance solution for your business.

Dynamic structure

The dynamics of the IBM ITGA are expressive of the flexibility of the method in meeting the needs of your business. They define the rigor by which your business approaches the development of a robust IT governance solution. While the static structure is generally unchanging across different companies (the objectives are the same), the dynamic structure varies greatly. In fact, the dynamics of the process provide enough flexibility for your business to vary the execution of the method from one release (version) of your IT government solution to the next.

The IBM ITGA conveniently organizes its roles, activities, and artifacts into eight distinct *disciplines*. These disciplines make the IBM ITGA easier to understand and navigate. Each discipline defines a level of activity that must be executed over time. The activities that are defined within each discipline may span multiple (and possibly all) life-cycle phases. Furthermore, the level of activity (the amount of effort expended) within each discipline will vary over time.

Figure 4-1 on page 88 illustrates the dynamic structure of the IBM ITGA as noted by the eight disciplines. Each of the eight disciplines are shown to execute over time. The relative area under the curve (for each discipline) represents the amount of effort expended in that discipline and at that point in time, especially relative to the phases and milestones. The higher the curve is, the more effort is expended. This chart shows that many disciplines have activity that is ongoing throughout much of the life cycle, which demonstrates that the IBM ITGA life cycle is built on a foundation of continuous feedback. It recognizes that changes, both internal and external, will occur and the life-cycle process must be capable of managing those changes. It accomplishes this in a formal way through the execution of short time frame periods called *iterations*.

An iteration is a vertical slice in time, such as a two-week period, through all of the disciplines that results in the achievement of a team-defined sub-objective of the enclosing phase objective. Each iteration is defined as the result of the coordinated effort of all applicable disciplines. Figure 4-1 on page 88 shows iterations across the bottom of the diagram.

As an example, the IBM ITGA defines the Executive discipline, which defines activities that should generally be completed in the early portions of the life cycle. However, these (Executive) activities drive downstream activities, such as Governance Design activities, which themselves are likely to challenge the output of Executive activities. When combined with a project plan that is defined by using iterations (the collaboration of multiple disciplines), a continuous feedback loop is set up that effectively manages continuously changing business conditions and the constant refinement of your understanding of both the problem and solution.

The dynamic structure of the IBM ITGA provides a powerful tool for the development of your IT governance solution. It is designed to accept that changes occur and to manage those changes in a controlled and just-in-time manner. This aspect of the IBM ITGA alone is responsible for geometrically driving risk out of the development of your IT governance solution.

4.1.4 Stages and milestones

The IBM ITGA is uniquely positioned to increase the likelihood that the IT governance solution you develop and deploy will both align strategically and execute to result in realized business value. To accomplish these objectives, the IBM ITGA is architected into two high-level stages, the Strategic Alignment stage and the Business Execution stage.

The *Strategic Alignment stage* ensures that the business has appropriately aligned the use of its IT resources to the strategic goals and objectives of the business. The *Business Execution stage* ensures alignment of these goals and objectives by instrumenting them with a fully integrated and capable IT governance solution infrastructure tool set. See the additonal material that accompanies this book (Appendix A, "Additional material" on page 105) for more information about the use of automated tools for IT governance solution execution.

These two stages are further decomposed into the following four life-cycle milestones that define intermediate business-level objectives that are to be accomplished throughout the life cycle:

► Life-cycle IT governance alignment milestone

This milestone specifies criteria that defines or identifies a strategic alignment between business and IT organizations. The IT governance solution team must have completed the setting of objectives for the remainder of the IBM ITGA life cycle. The team must also have defined precisely how business is aligned with IT, how IT is internally aligned, how (technology infrastructure) architecture is aligned, and the risk management strategies that must exist. *Alignment* may be described through a rigorous traceability model that describes the dependencies, exploitations, and performance measurements across projects and organizations. Your IT governance solution must provide an enabling strategy for this alignment.

► Life-cycle IT governance foundation milestone

This milestone specifies that your IT governance solution must have a baseline. The basline is a foundation on which strategic execution has been fully described and concretely implemented through applicable documentation and environment automation. The IT governance solution design must be completed and approved for introduction to project teams. In addition, the business is ready with an implemented project and portfolio management infrastructure and process.

► Life-cycle business performance milestone

This milestone specifies that a collection of meaningful business performance metrics exists that is sufficient to engage in an assessment of the impact of your IT governance solution. At this milestone, project teams will have executed projects by using your IT governance solution. However, there is not stipulation on project team execution that requires or aligns any level of completion of projects to this milestone. That is, there is no relationship between this milestone and project execution. The real-world project data that is collected up to this point is a snapshot of data from all participating or governed projects.

► Life-cycle business value milestone

This milestone results in an objective assessment of whether business value can be efficiently delivered through the use of your IT governance solutions. This milestone is not aligned with the actual delivery of any results from any (governed) project. In addition, this milestone will result in the availability of prioritized recommendations for improving the capabilities of your IT governance solution.

Important: Each milestone objective, especially during the Business Execution stage, is met in reference to the robust availability of objective project measurements that will lead to the improvement of the overall IT governance solution. Therefore, it is critical to the flexibility of your IT governance solution and to (governed) projects that you do not establish any relationships between the IBM ITGA milestones and intermediate or final results that are achieved by individual projects.

Figure 4-2 illustrates the foundation of the IBM ITGA, its stages, and milestones.
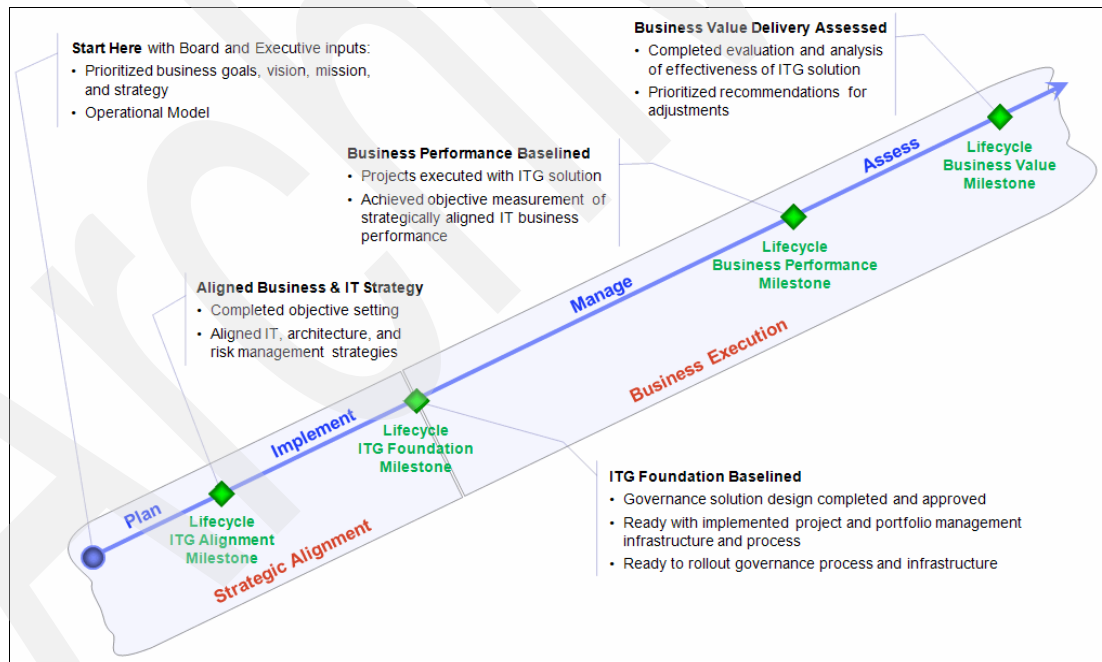
Figure 4-2   Foundation of the IBM IT Governance Approach

4.2 Phases and activities

In this section, we present an overview each of the phases and activities of the IBM ITGA. Figure 4-3 shows the lists of activities of the IBM ITGA and associates each list with the appropriate discipline.

> **Tip:** For more details about the IBM ITGA, see the additional materials that are provided with this book. You can download them as explained in Appendix A, "Additional material" on page 105. In addition, you can find the plug-in on the Rational Method Composer Web page at the following address:
>
> http://www-306.ibm.com/software/awdtools/rmc/library/
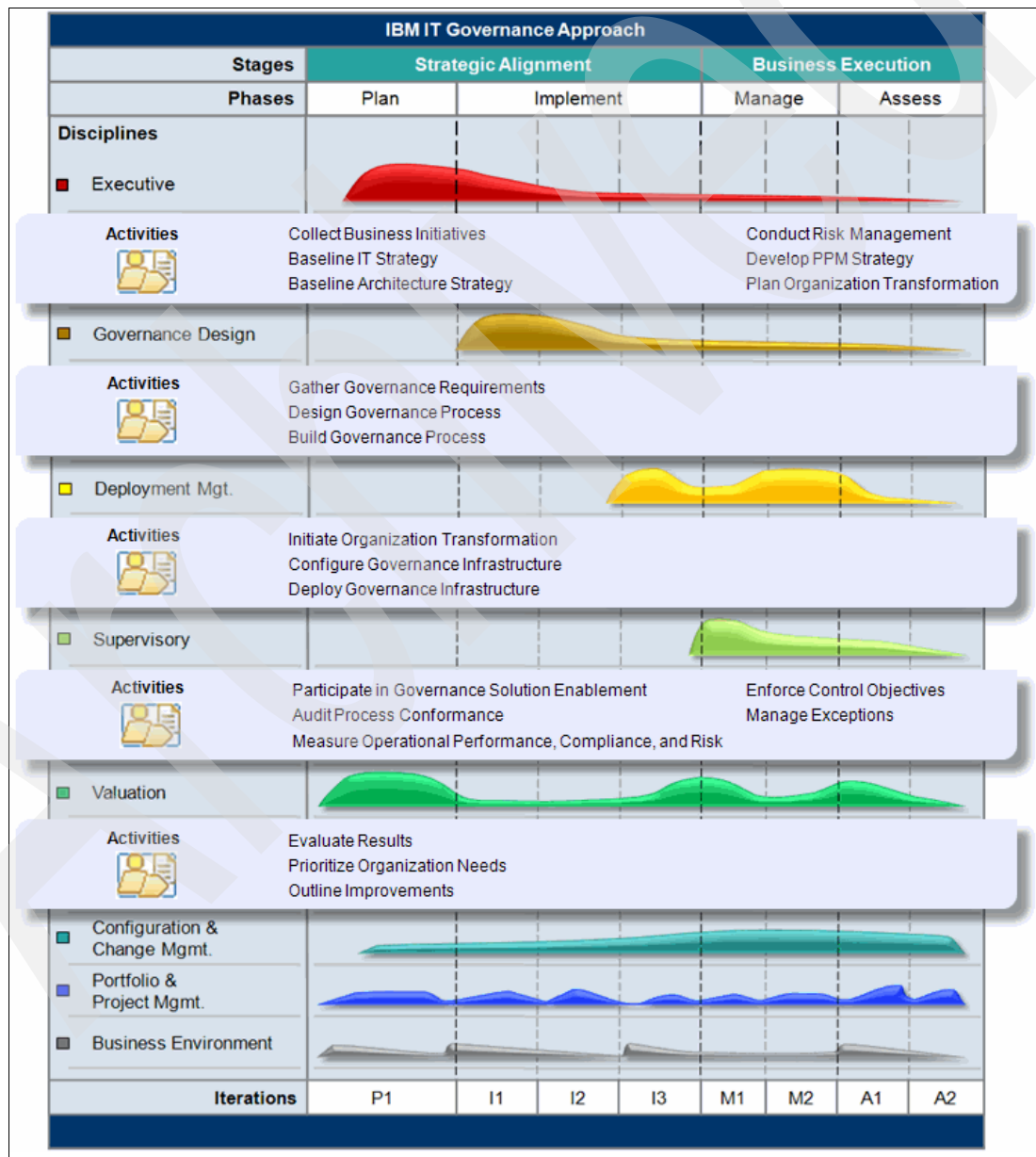
Figure 4-3   Activities of the IBM IT Governance Approach

4.2.1 Plan phase

The Plan phase of the IBM ITGA lays the groundwork for all other required activities that lead to the execution of the IT governance solution.

Objectives

The Plan phase evaluates the current business priorities that are otherwise known as the Strategic Capabilities Architecture. In the article "Creating a Strategic Capabilities Architecture" in the *Information Systems Management* magazine, William King suggests that the guiding architecture of a firm should be based on the strategic vision.[3] This vision bridges the existing status of the firm of "Where it is," and its projected future status of "Where it wants to be." All of this is from a business perspective, and not an IT perspective. This information is necessary in order to appropriately understand the overall goals of the business as you enter the solution design of IT governance in the Implement phase.

The Plan phase of the IBM ITGA ensures that there is a consistent vision among the practitioners of the Executive discipline regarding alignment between the goals and objectives of the business and the application of IT resources for maximum value impact. The Plan phase also ensures consensus regarding the ability of your business to understand how your current IT processes function.

The Plan phase has the following objectives:

► Establish the governance mission statement.
► Define the list of priority business issues and initiatives for the company.
► Establish a consolidated set of applicable corporate policies for IT governance.
► Define the initial set of key goal indicators and key performance indicators.
► Establish the agreed IT strategy and architectural framework.
► Identify the set of strategic threats and mitigation strategies.
► Establish the set of requirements for the design of the governed process.
► Define the set of IT principles by which all future initiatives will be gauged.
► Define the organization transformation roadmap for your IT governance solution.
► Define the plan for the implementation of the organization transformation roadmap.
► Define a plan to initiate the Implement phase of your IT governance initiative.

Activities overview

Table 4-1 describes the activities of the Plan phase of the IBM ITGA.

Table 4-1   Activities of the Plan phase

Activity	Description
Collect business initiatives	This activity entails the collection of the strategic business initiatives from the board, executive team, and lines of business for the purpose of defining input to the process of IT Governance Design.
Baseline the IT strategy	Baselining the IT strategy establishes the set of current operating conditions and direction needed to meet the automation needs of the business, including analysis of the strengths, weaknesses, opportunities, and threats (SWOT).
Baseline the architecture	Baselining of the architecture ensures that an accurate snapshot of the technologies, tools integrations, and geographic placement of information and functions is accounted for.

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[3] King, William. "Creating a Strategic Capabilities Architecture" *Information Systems Management*, Volume 12, Issue 1, 1995, pp. 67 - 69.

Activity	Description
Conduct risk management	Conducting risk management ensures an inventory of the potential failure scenarios for the business is accounted for. It also ensures that the appropriate mitigation strategies are in place to protect the interests of the business.
Develop Project and Portfolio Management (PPM) strategy	Development of a PPM strategy ensures that the business is examining all of its IT resources from a global perspective. This should include appropriate treatment of both proposals and active projects from several perspectives.
Plan organization transformation	Development of an organization transformation roadmap is key to the implementation of the governance solution. The IBM Development Organization Transformation (DOT) framework is used to define the roadmap.

Conclusion

To assemble the right IT governance solution, it is imperative that the key stakeholders of the business participate. Failure to do so only results in a system that is designed without a complete understanding of its requirements. Just as with designing any system, inadequate requirements design at the onset of a project causes the project to struggle throughout its lifetime.

The objective of the Plan phase is not merely to establish consensus among the members of the Executive discipline. It provides the data that is required for downstream activities for the deliberate design of optimized processes for operation, organizational structure design, automation of the governance infrastructure, and planning for the deployment of newly created, modified, or obsoleted components of the organization through the organization transformation roadmap. The Implement phase of the IBM ITGA consumes all of these inputs for deliberate design and deployment of the IT governance solution.

4.2.2 Implement phase

During the Implement phase of the IBM ITGA, you begin the design of your IT governance solution. You also start the process of deployment of your newly designed solution into your organization. For discussion, the Implement phase is decomposed into two parts, design and deploy, which are a function of the Governance Design and Deployment Management disciplines, respectively.

Objectives

The Implement phase of the IBM ITGA contains the hard-core tasks of defining your IT governance solution. This phase also applies appropriate rigor to the implementation of configuration management. It also applies change control over the artifacts that are used in the development of your formalized solution, including the definition of appropriate organizational structures to support organizational transformation activities. This phase also supports the development and configuration of an automated workflow to support enforcement of the defined workflows.

The Implement phase has the following objectives:

► Establish a set of requirements for the design of the governed process.
► Design and document the governed process including:

  – Role responsibilities for the execution of specific governed processes

  – Detailed descriptions of the activities required in support of the governed process

  – Guidelines for the configuration of tooling infrastructure in support of the IT governance solution and the governed management processes

  – Control points in the defined workflows

► Deploy the governed process.
► Automate workflow support and control point support in tooling.
► Employ organizational mechanisms to enforce the designed governing behavior:

  – Identify new organizational roles and organizational support requirements.
  – Disseminate decision rights.

Activities overview

Table 4-2 describes the activities of the Implement phase of the IBM ITGA.

Table 4-2   Activities of the Implement phase

Activity	Description
Gather governance requirements	This activity entails the identification of policies and the selection of applicable frameworks, methods, compliance requirements, and mitigation actions that will serve as input to the governance process design activity.
Design governance processes	This activity entails aligning and integrating the various selected processes and method frameworks into an integrated IT governance process.
Build governance processes	This activity entails transforming the governed process design into formalized workflow, detailing the roles, activities, and work products that are necessary for an integrated IT governance process.
Initiate organizational transformation	This activity entails restructuring the business as necessary to ensure the successful alignment of the goals and objectives of the business to processes that were defined in the design activity. It also includes educating the organization regarding the newly adopted processes and mechanisms for their enforcement.
Configure governance infrastructure	This activity entails configuration of the necessary tooling, including the automation required for the measurement and process enforcement, as well as the development of any required tool templates as necessary.
Deploy governance infrastructure	This activity entails roll out of the organizational structures, processes, and accompanying tools that are necessary for the on-going measurement, monitoring, and enforcement of the governed process as needed.

Conclusion

The Implement phase of the IBM ITGA defines the roles, responsibilities, activities, work products, and measures that provide executive management insight into the alignment of IT and the needs of the business to their satisfaction. However, the design of IT governance solution is not enough. Deliberate deployment depends upon management's ability to be

flexible to the changes that are provided by the governance team. In the Manage phase, we discuss how to conduct an iterative implementation of your IT governance solution.

4.2.3 Manage phase

The Manage phase of the IBM ITGA is decomposed into two parts, monitor and control. Monitor and control are a function of the Supervisory discipline.

The monitor part of this phase concentrates the efforts of your governance team in active participation of the deployed IT governance solution. The objective is to provide expertise by mentoring and measuring the effectiveness of the organization, as well as by providing objective external evaluation of process conformance.

In the control part of this phase, your governance team is responsible for enforcing the control mechanisms that are defined, as well as managing governance exceptions that may occur.

Objectives

The Manage phase of the IBM ITGA contains those activities that are necessary for the transfer of skills from your Governance Center of Excellence (CoE) team to the practitioners who must carry out the day-to-day activities of the governed process. These activities are enforced by the Governance CoE team through participation in the governed process as role-based participants through the exercise of assigned decision rights. This participation is not limited to project-level activities. It is enhanced by the required assignment of oversight in the audit of process conformance, as well as examination of productivity and product quality metrics. Identification of exception processing is required, along with tracking and resolution via process alteration of measurement adjustment.

The Manage phase has the following objectives:

► Ensure the successful deployment of the operationalized governance solution.
► Transfer skills to practitioners to manifest organizational change.
► Audit project units for governance process conformance.
► Measure business unit and project quality metrics against predefined goals.
► Manage exceptions to processing based upon the needs of the business.

Activities overview

Table 4-3 describes the activities of the Manage phase of the IBM ITGA.

Table 4-3   Activities of the Manage phase

Activity	Description
Participate in governance solution	This activity engages the Governance CoE, tools administration team and the training organization to implement the right size governance solution for your organization.
Audit process conformance	This activity evaluates the alignment of project teams to the defined governance process by comparing the documented processes to those processes in execution as well as product quality.
Measure operational performance, compliance and risk	This activity assesses metrics regarding both product quality and business unit performance measures relative to the predefined expected results.

Activity	Description
Enforce control objectives	This activity is executed based upon the assigned role of the governance team participant. Consider an event where the governed process calls for an authorization point in a work product life cycle, and the governance team member has been assigned this role in the project. This team member is required to enforce control objectives or counsel project teams as necessary.
Manage exceptions	This activity entails the documentation of project or governance process deviations for any reason, in order to request modifications to the measures, metrics, monitored processes, or all three.

Conclusion

The Manage phase of the IBM ITGA initiates the closure of the loop regarding the implementation of appropriate controls through a series of best practices. These practices are targeted at the project level to mitigate risk during the implementation of methods, tooling, and organizational change for the achievement of the strategic goals of the business. The most important practice includes the transfer of knowledge, know-how, and skills using iterative methods for project change. Implementation of tools for the management of development artifacts and automated business controls for implementation target systems with full traceability.

4.2.4 Assess phase

The Assess phase of the IBM ITGA formally closes the loop on the life cycle by providing formal feedback to the board of directors, lines of business, and projects, based upon the predefined goals that are substantiated in the business case for governance. The results are evaluated based upon the key performance indicators (KPIs) and key goal indicators (KGIs) that are defined during the Plan phase.

Objectives

The Assess phase has the following objectives:

► Evaluate the performance criteria of your IT governance solution against its fulfillment of the goals and objectives set forth during the Plan and Implement phases.

► Evaluate product quality goals and objectives that are established during the Plan and Implement phases.

► Identify any required changes to the following items:

– The governance process itself
– The management process
– The measures or metrics that are used for control of the governance process
– The measures or metrics that are used for the control of the management process

► Prioritize the current organization needs as a function of updating the current measures or process of either the management or governance functions.

► Identify and provide the business justification, outlining the potential improvements that can be realized by altering the existing processes.

► Examine the actual versus expected results of either the governance or management processes.

Activities overview

Table 4-4 describes the activities of the Assess phase of the IBM ITGA.

Table 4-4   Activities of the Assess phase

Activity	Description
Evaluate results	This activity engages the Governance CoE in the examination of the aggregated metrics from source measures that were based upon the KPIs and KGIs that were defined during the Implement phase. Evaluation of results are performed by comparing current results to a predefined baseline metric.
Prioritize organization needs	The activity of prioritizing organization needs takes place when analysis of the operational and quality metrics is completed. This assessment activity critically evaluates the baseline metric to the gathered results for the identification of operational and quality improvements. It does this along with critical examination of the measures and metrics themselves to assess their applicability to the problem space that is being measured.
Outline improvements	Outlining of improvements is the critical task of documenting the objective data, and analysis results to specify suggested changes to the target systems. These changes are either within the governance process or to the management process that produces the product output. These suggested changes close the feedback loop on the governance process and the management process. They do this by using the automated infrastructure to document recommended proposals, projects, and action for change to the various governance and management components.

Conclusion

The Assess phase of the IBM ITGA closes the feedback loop of the life cycle by identifying potential problems in the existing system and adding refinement as necessary. It also ensures that the initiatives that are undertaken by the business are providing the expected returns in the anticipated time frame. Through the use of regular monitoring and review, the goals and objectives of the business can be periodically adjusted based upon the evolving risks, vulnerabilities, and threats identified. The documented results from the Assess phase to the risk management activity, found in the Plan phase, formally closes the loop.

4.3 Differentiators of the IBM IT Governance Approach

The IBM ITGA is unique in its approach and distinguishes itself from other IT governance methods and implementation strategies. The IBM ITGA has the following key differentiators:

► It has a flexible and adaptable architecture coupled with specific guidance that is designed to maximize the effectiveness of your developed IT governance solution. The flexibility of the method itself allows it to scale up to meet the needs of the most rigid and regulated environments and to scale down to meet the needs of even the smallest, unconstrained businesses.

► It is a method that describes what needs to be done in order to implement effective IT governance solutions.

► It highlights the importance of aligning your business, IT organizations, and enterprise architecture to establish a basis from which strategic business value may be realized.

► It includes strategic business execution components as well as strategic alignment and planning components that provide a true closed loop of responsibility framework.

- ► It contains details for the integration of regulations, policies, frameworks, and other methods.

- ► It describes the entire automated infrastructure for the management of all IT governance and project artifacts.

- ► It answers the question: "How does IT governance ensure compliance requirements?"

- ► It describes the relationship between low-level practitioner activities and their impact on the satisfaction of business goals and objectives of IT.

- ► It uses an integrated artifact repository for automated measurement and metrics generation tooling and reports.

- ► Its integrated tooling enforces *tool directed behavior* to ensure process conformance by practitioners. Tool directed behavior helps to enforce as much or as little process as desired, and it is more effective than any automation.

4.4 Organizational context for the IBM IT Governance Approach

The IBM ITGA is a critical governance enabler for your company. As such, it is important to understand the relationships and context for its operationalization. In this section, we offer that context from both an IT and company-wide perspective.

4.4.1 IT organization context

The IBM ITGA is a critical component of your foundation for execution as described by Robertson, Ross, and Weill in their book *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution.*[4] They define a foundation for execution as "the IT infrastructure and digitized business processes automating a company's core capabilities."

Figure 4-4 illustrates the relationships between IT governance and your foundation for execution. It also highlights the placement of the IBM ITGA within this context. Your governance solution ("IT Governance" in the illustration) is a business process that is output from and continually refined by the IBM ITGA.
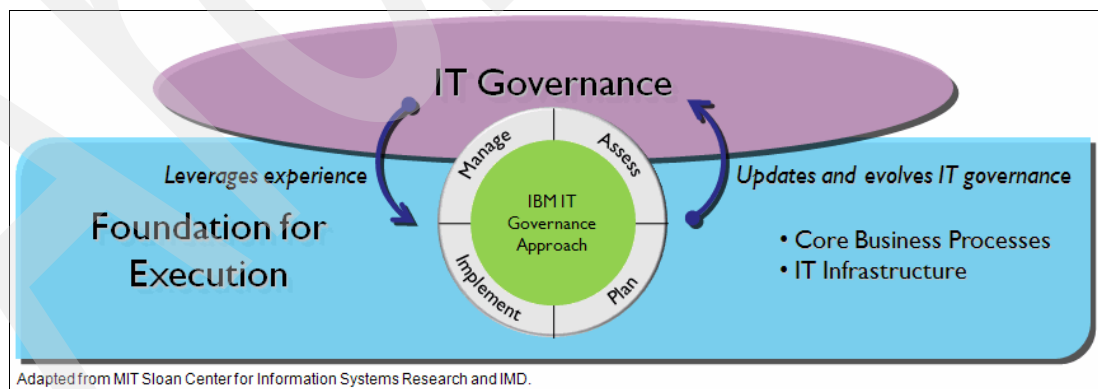
Figure 4-4   The influence of your foundation for execution on your IT governance solution

Tip: Your IT governance solution is output from implementation of the IBM ITGA, both of which are critical business processes within your foundation for execution.

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[4] Robertson, David C., Jeanne W. Ross, and Peter Weill. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution.* Harvard Business School Publishing, 2006. pp. 1-24.

Figure 4-4 illustrates your IT governance solution as a single entity. However, in practice, your IT governance solution will be composed of many kinds of IT governance entities called *governance disciplines* as illustrated in Figure 4-5. Together these governance disciplines comprise the IT governance landscape for your business. The IBM ITGA is designed to provide your business with a consistent approach and a coordination point for the development and deployment of your entire governance landscape. In Chapter 2, "IT governance solution strategy" on page 15, we discuss the relationship between your governance landscape and your organizational structure as being a critical aspect of the overall effectiveness of your IT governance solution.
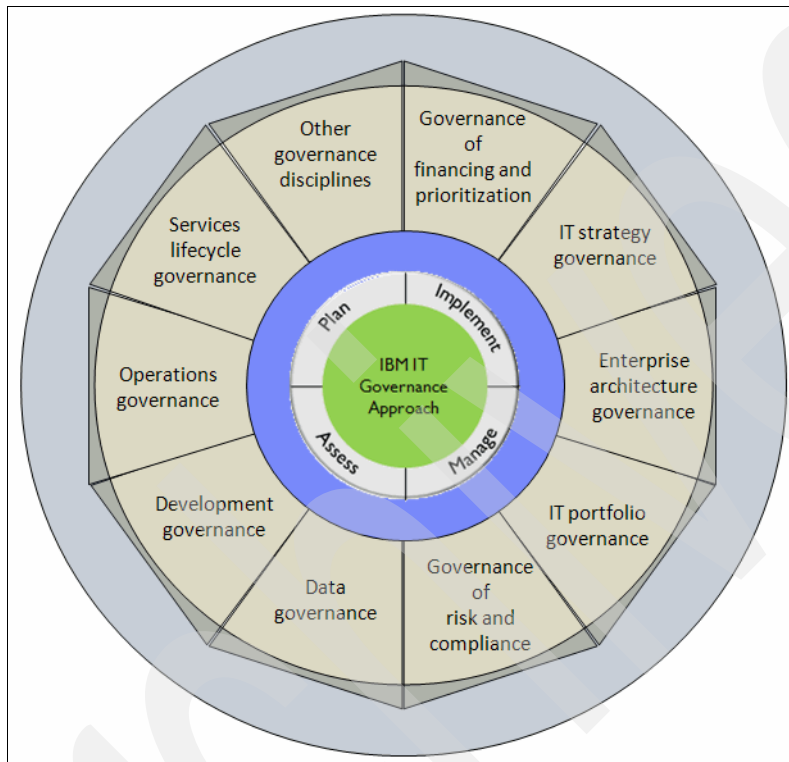
Figure 4-5   Support of the IBM IT Governance Approach for the whole IT governance landscape

Your foundation for execution positions the IBM ITGA well. It provides a convenient IT organization perspective from where you can launch the development and adoption of your IT governance solution. Within this context, the IBM ITGA receives input from the IT governance solution in the form of experiential data due to execution of that solution. The input can then be translated into new requirements that can drive a new or changed IT governance solution (the output of the IBM ITGA). This illustrates the closed loop nature of the IBM ITGA. However, this picture is missing an enormous amount of context, the kind of context that is likely to reshape your entire IT governance solution. That context is the company-wide context for the IBM ITGA.

4.4.2 Company-wide context

As we have discussed, IT governance is not a concern of your IT organization. It is the concern of your entire company, especially for your business initiatives that depend on IT resources for execution.

The development of an IT governance solution without the full and proper context of the business is likely to result in a solution that is not specifically designed to support the strategic

objectives of your business. An IT governance solution that is designed and implemented solely within the IT organization will be designed to benefit only the IT organization. In practice, such a solution will benefit no one without consideration of the entire value chain of the business (customer to customer). Even worse, it will negatively impact the business in ways that may be relatively invisible, across organizational boundaries. The value of your IT governance solution is likely to be compromised at your organizational boundaries. Proper forethought and management support is essential to build the organizational transparency necessary to be successful. Otherwise, your attempt to build an effective IT governance solution through execution of the IBM ITGA will not meet expectations.

> **Tip:** Developing organizational transparency is critical in the adoption of effective IT governance.

To use the IBM ITGA to build and execute your IT governance solution in the full and complete context of your business, you must consider your company's operating model and enterprise architecture as illustrated in Figure 4-6.[5]
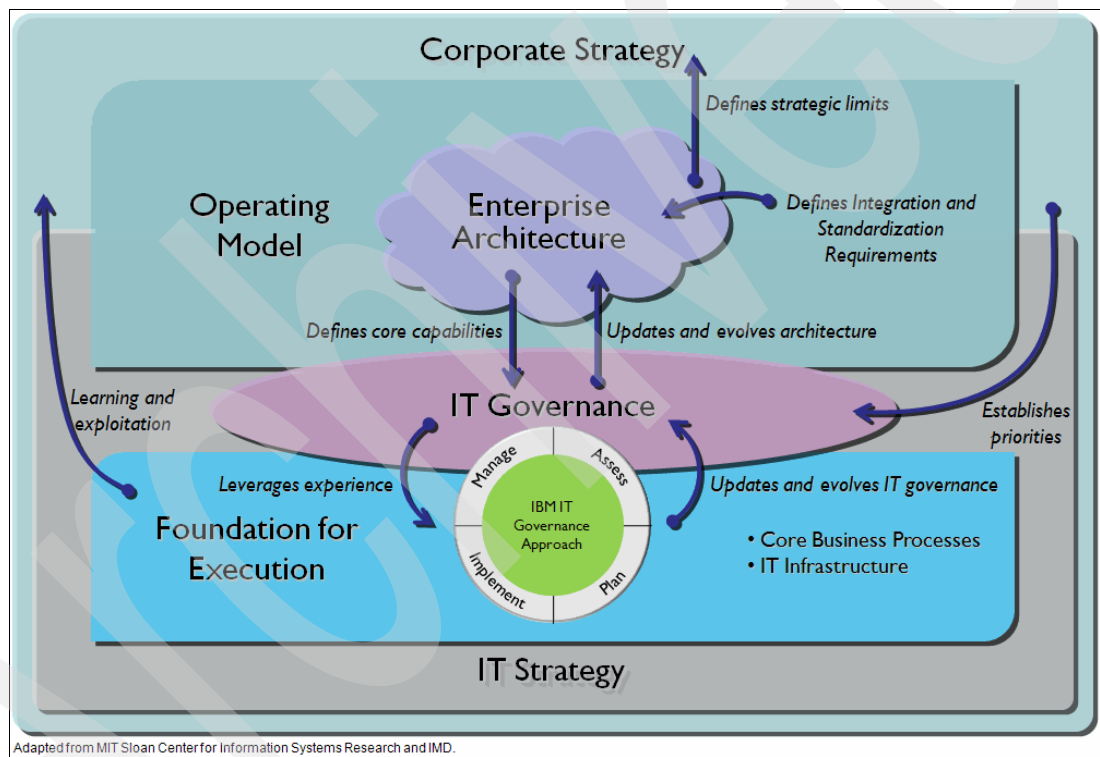
Figure 4-6   The IBM IT Governance Approach in the full business context

4.4.3 IBM IT Governance Approach executes IT governance

The IBM ITGA is involved in both the development and execution of your IT governance solution. This approach is deliberate and necessary. It is designed so that the value opportunity you build into your IT governance solution is realized to the maximum extent possible. By integrating the responsibility for strategic execution (through the execution of your IT governance solution) into the IBM ITGA, your business develops the vision for strategic execution through IT governance. In addition, and more importantly, it builds the knowledge and experience necessary to realize its true benefits. The IBM ITGA accomplishes

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[5] Adapted from Robertson, David C., Jeanne W. Ross, and Peter Weill. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution.* Harvard Business School Publishing, 2006. Figure 1-2, p. 10.

this alignment through a high-level architecture that is focused first on strategic alignment (the Strategic Alignment stage) and then on business execution (the Business Execution stage).

> **Tip:** Your IT governance solution team (your IT Governance CoE) must ensure that project teams execute strategically with respect to the whole business context.

The IBM ITGA accomplishes its objectives, in part, by leveraging real-world project experiences and information for the purpose of converging on the ideal IT governance solution. This solution is one that efficiently and predictably enables the realization of your business strategy. The Business Execution stage ensures that your project teams, who are adopting your (new or changed) IT governance solution, are using it correctly and that the solution does not introduce business inhibitors. This strategy defines an overlap of the IBM ITGA and your (loosely coupled) project management processes as illustrated in Figure 4-7.
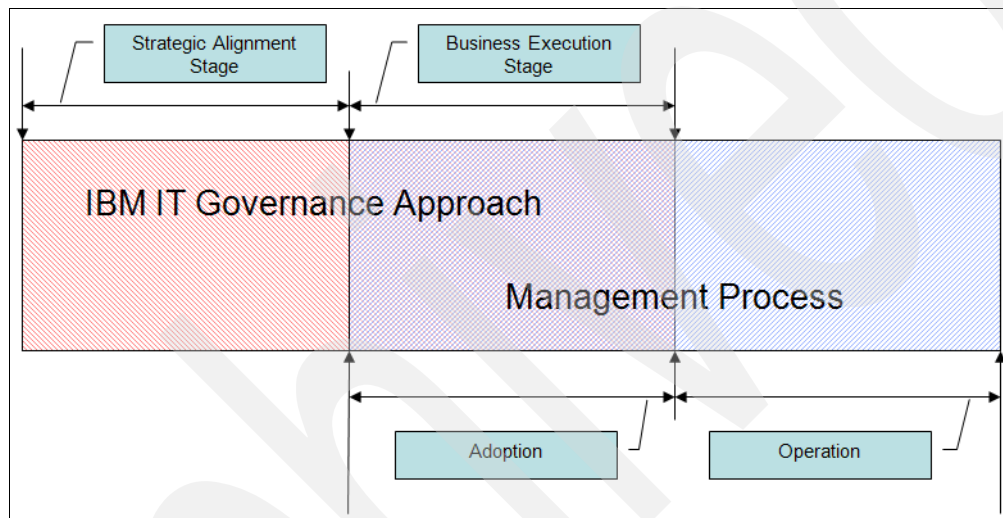
Figure 4-7   IBM IT Governance Approach alignment with project management processes

Project management processes, relative to your IT governance solution, essentially execute in two periods, Adoption and Operation. Through the Adoption period, your IT governance solution team works closely with your (governed) projects to ensure that knowledge is transferred and that governance activities are effective. Following this period, and through an assessment of specific exit criteria, the project team enters the Operation period by using your IT governance solution. During this period, the project team continues to use the IT governance solution for strategically aligned execution. However, it generally will not have the continuous (hands-on) support of your IT governance solution team as in the Adoption period.

The cycle depicted in Figure 4-7 repeats for each subsequent introduction of a new or changed IT governance solution. See Chapter 3, "IT governance adoption strategy" on page 59, for an in-depth discussion about IT governance implementation, including the incremental adoption of your IT governance solution.

Additional material

This book refers to additional material that can be downloaded from the Internet as described below.

Locating the Web material

The Web material associated with this book is available in softcopy on the Internet from the IBM Redbooks Web server. Point your Web browser at:

`ftp://www.redbooks.ibm.com/redbooks/SG247517`

Alternatively, you can go to the IBM Redbooks Web site at:

`ibm.com``/redbooks`

Select the **Additional materials** and open the directory that corresponds with the IBM Redbooks form number, SG247517.

Using the Web material

The additional Web material that accompanies this book includes the following files:

File name *Description*
SG247517.pdf PDF file that contains an overview of a governance scenario and the phases of the IBM IT Governance Approach, which includes the Plan, Implement, Manage, and Assess phases

System requirements for downloading the Web material

The following system configuration is recommended:

Hard disk space: 22 MB
Operating System: Windows XP with Acrobat Reader
Processor: Minimum to support Windows XP
Memory: Minimum required to support Windows XP

How to use the Web material

Create a subdirectory (folder) on your workstation, and unzip the contents of the Web material zip file into this folder.

Abbreviations and acronyms

ATC	air traffic control	**SOA**	service-oriented architecture
BAR	Business Alignment Review	**SOMA**	Service-Oriented Modeling and Architecture
CMMI	Capability Maturity Model Integrated	**SOX**	Sarbanes-Oxley
COBIT	Control Objectives for Information and related Technology	**SWOT**	strengths, weaknesses, opportunities, and threats
CoE	Center of Excellence	**WBS**	work breakdown structure
DOT	Development Organization Transformation		
DRR	Deployment Readiness Review		
EXR	Efficiency and Execution Review		
IBM	International Business Machines Corporation		
ICT	Information and Communication Technology		
IDG	International Data Group		
IRR	initial rate of return		
IT	information technology		
ITGA	IBM IT Governance Approach		
ITGI	IT Governance Institute		
ITIL	IT Infrastructure Library		
ITSO	International Technical Support Organization		
KGI	key goal indicator		
KPI	key performance indicator		
LOM	life-cycle objective milestone		
NASA	National Aeronautics and Space Administration		
PCAOB	Public Corporate Accounting Oversight Board		
PIMA	Plan, Implement, Manage, and Assess		
PPM	Project and Portfolio Management		
PSM	Practical Software and Systems Measurement		
QA	quality assurance		
RACI	Responsible Accountable Consulted Informed		
RMC	Rational Method Composer		
ROI	return on investment		
RUP	Rational Unified Process		
SAR	Strategic Assurance Review		
SLA	service-level agreement		

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this book.

IBM Redbooks

For information about ordering *Rational Business Driven Development for Compliance*, SG24-7244, see "How to get Redbooks" on page 111.

Other publications

These publications are also relevant as further information sources:

► Barnett, Liz, Murray Cantor, and Rachael Rusting. *Governing the business process of software and systems development*. IBM Corporation and EZ Insight Inc.

  http://www-935.ibm.com/services/us/cio/optimize/optit_wp_swg_governing.pdf

► "Black Monday: the Stock Market Crash of 1987," by Stock Market Crash, 2006.

  http://www.stock-market-crash.net/1987.htm

► Cantor, Murray and John D. Sanders. "Operational IT Governance." *The Rational Edge*. IBM Corporation, 2007.

  http://www.ibm.com/developerworks/rational/library/may07/cantor_sanders/

► Carr, Nicholas G. "IT Doesn't Matter," *Harvard Business Review*. May 2003.

► Cockburn, Dr. Alistair. "What Engineering Has in Common with Manufacturing and Why it Matters." *Cross Talk: The Journal of Defense Software Engineering*. April 2007.

  http://www.stsc.hill.af.mil/crosstalk/2007/04/0704Cockburn.html

► Collins, Jim. *Good to Great*. Harper Collins Publishers, Inc., 2001. ISBN 0-06-662099-6.

► Demings, William Edwards. *Out of the Crisis*. MIT Press, Second edition 2000. ISBN 0-262-54115-7.

► Eason, Zoe, Maria Ericsson, and Lynn M. Mueller. "Transforming your software development capabilities: A framework for organization." IBM Corporation, 2005.

  http://www.ibm.com/developerworks/rational/library/sep05/eason/

► Ericsson, Maria. "The governance landscape: Steering and measuring development organizations to align with business strategy." *The Rational Edge*. IBM Corporation, February 15, 2007.

  http://www.ibm.com/developerworks/rational/library/feb07/ericsson/

► Henderson, J. C. and N. Venkatraman. "Strategic alignment: Leveraging information technology for transforming organizations." *IBM Systems Journal*, Vol. 32, No. 1, 1993, 1999.

  http://www.research.ibm.com/journal/sj/382/henderson.pdf

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► Hopkins, J. Marc. "How to Justify an IT Project With Uncertain Returns (And Still Make Your CFO Happy)." *CIO*, August 22, 2007.

http://www.cio.com/article/132452

► Kaplan, Robert S. and David P. Porter. *The Strategy-Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment*. Harvard Business School Press, 2001. ISBN 1578512506.

► King, William. "Creating a Strategic Capabilities Architecture" *Information Systems Management*, Volume 12, Issue 1, 1995, pages 67 - 69. DOI: 10.1080/07399019508962957.

► Kotter, John P. *Leading Change.* Harvard Business School Press, 1996. ISBN 0875847471.

► Kroll, Per and Walker Royce. "Key Principles for Business Driven Development." *The Rational Edge*. IBM Corporation, October 15, 2007.

http://www.ibm.com/developerworks/rational/library/oct05/kroll/

► Landsberger, Henry. *Hawthorne Revisited: Management and the Worker, Its Critics and Developments in Human Relations in Industry*. Cornell University Press. January 1957. ISBN-13: 9780875462646.

► Ohno, Taiichi. *Toyota Production System: Beyond Large Scale Production*. Productivity Press, 1988. ISBN 0-915-29914-3.

► Pissello, Thomas. *The ROI of Enabling Software Development Governance using IBM Rational Solutions*. Alinean, Inc., August 2006.

http://www.alinean.com/PDFs/The%20ROI%20of%20Software%20Development %20Governance.pdf

► Poppendieck, Mary and Tom*. Implementing Lean Software Development: From Concept to Cash*. Addison-Wesley, 2007. ISBN 0-321-43738-1.

► Robertson, David C., Jeanne W. Ross, and Peter Weill. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution.* Harvard Business School Publishing, 2006. ISBN 1-59139-839-8.

► Rossi, Sandra. "Maximize ROI: Six Time-wasters CIOs Need to Avoid." *Computerworld*, April 27, 2007.

http://www.cio.com/article/106601/Maximize_ROI_Six_ Time_wasters_CIOs_Need_to_Avoid

► Royce, Walker. "Improving Software Development Economics, Part I: Current Trends." *The Rational Edge*. IBM Corporation, April 2001.

http://download.boulder.ibm.com/ibmdl/pub/software/dw/rationaledge/apr01/Improv ingSoftwareDevelopmentEconomicsPartIApr01.pdf

► Tenner, Arthur R. and Irving J. DeToro. *Process Redesign: The Implementation Guide for Managers*. Prentice Hall PTR, 1996. ISBN 0-201-63391-4.

► *The American Heritage College Dictionary, Fourth Edition*. Houghton Mifflin Company, 2007. ISBN 0618835954.

Online resources

These Web sites are also relevant as further information sources:

- ► Control Objectives for Information and related Technology

  http://www.isaca.org/cobit
- ► IBM DeveloperWorks

  http://www.ibm.com/developerworks/
- ► IBM Rational Unified Process

  http://www.ibm.com/software/awdtools/rup/
- ► IBM Service Management: The IBM Tivoli Unified Process

  http://www.ibm.com/software/tivoli/governance/servicemanagement/itup/tool.html
- ► IBM Systems Journal

  http://www.research.ibm.com/journal/sj/
- ► Rational Process Library

  http://www.ibm.com/software/awdtools/rmc/library/
- ► Service Management - ITIL (IT Infrastructure Library)

  http://www.best-management-practice.com/IT-Service-Management-ITIL/
- ► The Rational Edge: The e-zine for the Rational community

  http://www.ibm.com/developerworks/rational/rationaledge/

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IBM IT Governance Approach
Business Performance through IT Execution

IBM ®

Redbooks ®

Optimizing business performance through IT strategy, goals, and objectives

Enabling and empowering people to deliver strategic business value

Automating IT governance with IBM Rational software

Information technology (IT) governance has assumed a prevalent spot in technical and management publications. When academics and practitioners alike pose such questions as "Does IT matter?", those of us in the IT field cannot help but to sit up and take notice. We must manage with a focus on articulating the value of IT investments so that the CEO understands what a dollar spent on technology yields in real earnings impact. We must also focus on helping the CIO feel comfortable with balanced risk exposure. The development of a management system that ensures IT can consistently deliver on these objectives is what IT governance is all about.

Guidance in building this type of solution is what this IBM Redbooks publication is about. It explores key concepts that underpin the successful development of your IT governance solution. This book explains the following concepts:

► The right amount of flexibility to yield more effective results
► Approaches to measuring the value of IT's contribution to the business
► The linkage between systematic reduction of variance in reducing project risk
► The role of automation in providing executives the information necessary to adjust to changes on projects

These lessons are codified in the IBM IT Governance Approach, which you instantiate within your organization. By applying this approach with the guiding principles and automating with technology, you will yield a governance solution that is adopted and viewed as an enabler to your teams. Most importantly it will ensure that IT delivers its mission to add measurable business value and reduce risk to the business.