

# INFORMATION TECHNOLOGY

## A Pathfinder to Better Performance

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*“Our Age of Anxiety is, in great part, the result of trying to do today’s jobs with yesterday’s tools.”*

Marshall McLuhan

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IT can be to government what high-tech firms have been to the economy—a catalyst for change that efficiently links key information to secure access points and an engine driving rapid growth. Of course, the opposite is also true: IT failures can seriously harm government effectiveness.

Why? Technology and information have become so important to how government operates that even small changes can dramatically affect many areas. This reality is reflected in the amount of IT assets accumulated over years due to large IT budgets, often second only to payroll in size. *How many of these assets are still underleveraged, for whatever reason? What impact on results would an across-the-board 10 percent increase in return on assets (ROA) have?*

Clearly, the stakes are high. And yet, IT is often seen as a simple support function or an expense ripe for outsourcing. It is rarely seen as an enabler or creative pathfinder for government.

IT’s daily pressures often derive from thankless, sometimes no-win tasks, such as ensuring core service levels of uptime, data quality, security and compliance. Beyond these basic operations—“keeping the lights on”—IT must also respond to the never-ending and always changing needs of citizens. The challenge of managing their expectations is intensified by the pressure to reduce costs, do more with less and even outsource major capabilities.

Organizations often cite poor alignment of IT with other functions as the key challenge. IT, however, can be the pathfinder that helps agencies and municipalities discover a new way to drive value and maximize results. Unfortunately, the opportunity for IT to demonstrate this is often blocked by three common barriers.

*Barrier 1: Effective alignment cannot succeed without a common language and unifying map*

IT must be well aligned with the organizational mission. Much has been written about processes for achieving greater alignment in IT decisions. These include:

- Securing senior executive sponsorship.
- Implementing gating procedures and ROI justifications for project approvals.
- Establishing steering committees and business partnering roles and responsibilities.

However, for any of these processes to be successful, IT and the organization as a whole need to share a common language and unifying map.

This is really about building a relevant context for what IT can do. The language and map must reflect a fundamental understanding of what issues matter to success. Then you can form a credible view on how IT capabilities can help. The map must show how IT capabilities fit among the organization's other functions, processes, decisions and, most important, goals. It must show who benefits from these capabilities. And it must be able to communicate the strengths and weaknesses of these IT capabilities across a range of infrastructure, applications and information, as well as how to manage them. Think of it as a Google™ Earth tool for IT. Zoom in on objectives and evaluate different technical options based on an understanding of detailed capabilities.

**Executive-Level Visibility**



**IT Options/Paths**



**Detailed IT Capabilities**

The common language and unifying map should include the fundamental anchors of metadata, such as customer, program and location, along with standard rules. Finally, it must also clarify and explain IT terminology. Nontechnical audiences should be able to understand the impact of IT in laymen's terms and answer some fundamental questions, including:

- Where are we today, where do we want to be, and how can we get there?
- What processes and strategic goals are being negatively affected?
- How could IT drive better performance? Which users stand to benefit?
- How well do multiple, discrete IT assets combine to fulfill complex performance requirements?
- What information do we need to drive better decision-making capabilities, in terms of content (measures and dimensions), rules (metadata) and use (functionality)?
- What financial and human resources do we require to fulfill your goals?
- How should costs be aggregated and allocated to reflect actual use?
- What are the cost/benefit trade-offs between alternative technical options?

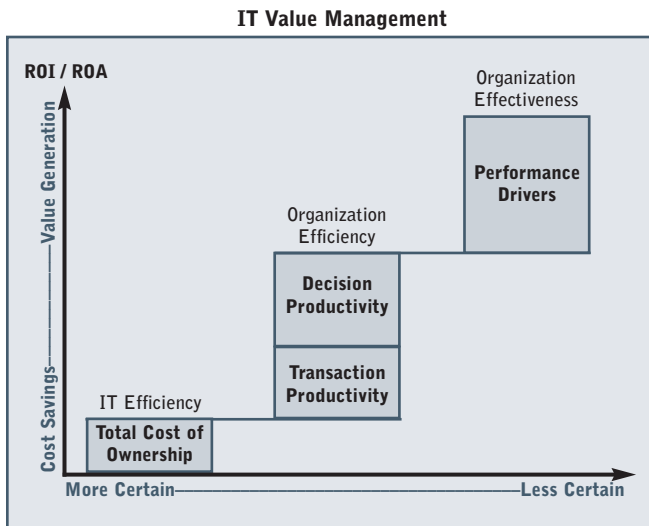
*Barrier 2: The difficulty of developing more credible, closed-loop measurements of IT's value*

It is standard practice within most IT departments to evaluate the return on investment for projects and initiatives and measure the cost/benefit of various IT capabilities. The challenge comes in developing a value measurement system that:

- Is credible with Finance and users alike.
- Provides insight into cause and effect drivers.
- Goes beyond point measurement to reflect the entire organization.
- Is consistent across projects, departments and units.
- Provides a closed loop so that results can be compared to the plan and lessons learned.

Fundamentally, IT creates value by improving operational efficiency and/or effectiveness, but defining what this actually means isn't straightforward. One approach is to use the simple notion of input/output changes. Greater efficiency means reducing input cost—the effort or time required to achieve a given level of output. Greater effectiveness means achieving better-quality or higher-value output for the same level of input. A further guideline for defining useful metrics is to divide them into three distinct categories:

- **IT efficiency** → Direct total cost of ownership (TCO) savings in use of IT resources.
- **Organization efficiency** → Productivity savings in terms of business users' time to perform both transaction and decision-making work.
- **Organization effectiveness** → Improved business performance from faster and more informed decision-making.



These three categories include measures ranging from cost savings (efficiency) to value generation (effectiveness), as well as from more to less certainty in the numbers. This is the dilemma and the challenge for IT: the greatest opportunity for ROI and ROA is also the least verifiable and therefore the least credible.

Hard numbers around IT efficiency, such as cost savings and cost avoidance, are easier to measure and are often the only ones Finance sees as credible. Organizations document such costs or they occur upfront and therefore involve fewer future projections. Pursuing TCO is a well established discipline. It captures hidden costs such as implementation, change orders, maintenance, training and user support. TCO also evaluates common drivers of IT inefficiency such as lack of standardization and consolidation.

Determining the value of efficiency in user productivity improvements is somewhat harder. However, there are established processes. Historically, IT's primary focus has been on improving efficiency through automation. Cost savings in core transaction processes justified much of the countless dollars spent on technology over the last decade. The heavy investment required to implement enterprise resource planning (ERP) systems, for example, was usually justified based on the ROI of process improvement that reduced cost per transaction.

However, measuring value merely in terms of IT efficiency from cost savings, or efficiency from improved transaction productivity, understates the total value. Many government agencies have yet to achieve the major cost savings available from consolidations, platform standardization and transaction process improvements that have been achieved by commercial organizations. As more of these modern systems and integration projects come online and the cost savings are achieved, the bigger opportunity for realizing value is in improving the efficiency and effectiveness of decision-making that will come from more complete and timely access to information.

As noted in the introduction, analysis from McKinsey shows that the proportion of more complex decision-based (tacit) work has increased relative to transaction-based work. It now represents more than 50 percent of the workload in many industries.

Unfortunately, decision-based work is much harder to measure and therefore to determine how to improve. It is information-intensive, interactive, frequently subjective and often iterative. IT must evaluate the value of improving efficiency and effectiveness around decision-making work. The critical asset—and therefore the element to measure—is information. IT delivers value through quality of information. You measure that quality in terms of relevance, accuracy, timeliness, usability and consistency. The higher the quality of information, measured across all of these factors, the better the potential for decision-making. This leads to greater user productivity and the ability to achieve performance goals.

Some metrics on decision productivity come from monitoring the use of a reporting, scorecarding or overall performance management system. *How many people use it? How often do they use it? When do they use it? How often are reports updated? How many new reports do users create? Who are these power users?* IT can also track user feedback about information quality through self assessments and qualitative ratings.

Metrics quantifying effectiveness are in some ways more straightforward, although not necessarily as certain or verifiable. These are based on the performance metrics for the decision area you are improving. As demonstrated throughout this book, decision areas are defined by drivers and outcomes that reflect the cause-and-effect relationships among organizational issues. This metric hierarchy provides the logic for ROI/ROA calculations and for monitoring success over time.

### *Barrier 3: Lack of good decision-making information for managing IT*

IT often lacks its own decision-making information. Beyond the need for metrics noted above, IT needs a context for making a wide range of decisions, as well as for filtering the volume of data it generates. There are two types of IT information sources that are often not fully integrated or harnessed.

The first comes from applications that serve IT processes. Use of information from systems management tools has become quite common, notably to manage security and compliance issues. For example, for commercial organizations, compliance with General IT and Application Controls regulations involves reviewing access rights, incident logs, change and release management data and other information generated by IT applications. This information is useful for making decisions beyond compliance.

The second source comes from having more consistent information about the IT management process itself. In the private sector, Sarbanes-Oxley legislation has been a catalyst for the widespread adoption of best practices in IT, with many of these initiatives finding their way into government IT organizations. These practices include:

- Frameworks such as Control Objectives for Information and related Technology (COBIT®) from the IT Governance Institute and the Information Technology Infrastructure Library (ITIL) framework.
- Methodologies such as the software development life cycle (SDLC).
- Organizations such as the Project Management Institute (PMI).

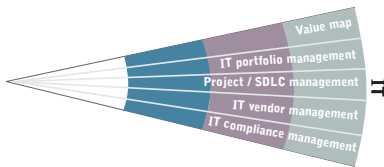
Greater acceptance and use of these best practices provides more information about IT and the processes, organizations and users that IT supports.

## The Business of IT

The five decision areas described in this chapter provide IT with insights and facts to help drive overall value. The sequence of these decision areas provides a logical and iterative flow of analysis and action. The start and end point—IT with a clear view of where and how it is driving value—sets the basis for priorities and plans to close gaps. You require a detailed understanding of the effectiveness of IT assets, both individually and combined, to see how to make them more effective. In order to optimize your current assets or add new ones, you must monitor the projects closely and manage vendors. Finally, you need visibility over the many “moving parts” to ensure you comply with public mandates to mitigate risks.

Decision areas on IT:

- **Value map** → Where and how does IT drive business value?
- **IT portfolio management** → How are IT assets optimized for greatest ROA?
- **Project/SDLC management** → Are projects on time, on budget, on target?
- **IT vendor management** → Are vendor service levels and costs managed optimally?
- **IT compliance management** → Are IT risks and controls managed appropriately?



## Value Map

The value map provides a high-level view of IT's effect, both currently and potentially. This information sweet spot combines common language with value measurement in a single unifying map for use throughout the organization. Of the five decision areas, this is the most important for driving better alignment between IT and the other functions. It helps define the demand for IT and the ways IT can assist. Organizations use the value map at different levels and stages of IT processes. These include defining IT strategy, setting priorities, approving projects and investments, defining requirements, monitoring user acceptance and validating success.

The value map provides a consistent understanding of the organization and an overall understanding of IT in terms of organizational entities, transaction processes, systems, people and their overall relationship to financial accounts. The value map provides context and measures gaps in current or projected IT capabilities.

This helps clarify the *where/who/how/what/when* questions:

- *Where* are better IT capabilities needed in terms of organizational units, functions and processes?
- *Who* are the users and stakeholders of better IT capabilities?
- *How* will better IT capabilities drive value (and have they done so in the past)?
- *What* are the requirements for developing better IT capabilities?
- *When* must better IT capabilities be available?

This decision area lets you compare strengths and weaknesses in IT capabilities across different departments, processes and functions. Then you can relate any gaps back to the drivers of performance. *Information quality is a leading indicator of value—is IT delivering the right information at the right time to the right decision-makers?* You can evaluate gaps in information quality using a number of qualitative factors. These include relevance, accuracy, timeliness, availability, reliability, breadth of functionality and consistency. These factors can be used to clarify cost/benefit options and let you prioritize potential improvements.

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*“With a performance management system, it is very very easy for people to get their own reports, anywhere in the country, without having to put in requests. This has relieved a huge burden on the IT staff.”*

Judith M. Marte, Chief Budget Officer, Miami-Dade County Public Schools

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## VALUE MAP

GOALS	METRICS	DIMENSIONS		
Business Priority Score	BI Users (#)	Current/Target Scenario	IT Project Status	
Business Value (\$)	Business Effectiveness Index	Scenario	IT Project Status	
Information Quality Index	Business Efficiency Index	Decision Processes	IT Projects	
IT Capability Index	Employees (#)	Business Function	IT Project Type	
IT Costs (\$)	Information Accuracy Rating	Decision Area	IT Project	
	Information Availability Rating	Employee Decision Role	Key Business Information	
	Information Consistency Rating	Work Function	Business Subject Area	
	Information Relevance Rating	Decision Role	Metadata Model	
	Information Timeliness Rating	Reporting Period	Organization	
	Information Functionality Rating	Year	Division	
	IT Project Costs (\$)	Quarter	Department	
	IT Projects (#)	Month	Organization Code	
		Information Supply Chain	Strategy Focus	
		Information Supply Chain	Strategic Area	
		Information Stage	Strategy	
		IT Improvement Priority	Transaction Processes	
		IT Improvement	Process	
		Priority Rating	Sub-Process	
			Activity	
FUNCTION	DECISION ROLES	PRIMARY WORK	CONTRIBUTORY	STATUS
IT/Systems	Executives Managers Analysts Professionals	*		
Finance	Executives Managers Analysts Professionals	*		*
Customer Service	Executives Analysts		*	*
Program Management	Executives Analysts		*	*
Services	Executives Analysts		*	*
Procurement	Executives Analysts		*	*
Operations/Production	Executives Analysts		*	*
Human Resources	Executives Analysts		*	*
Risk Management	Executives Analysts		*	*
Audit	Executives			*
Regulatory	Executives			*
General Management	Executives			*

### IT Portfolio Management

This is the supply side of the IT value equation, while the value map decision area is the demand side. Portfolio management offers details of and insights into the organization’s IT assets, how well these support the organization and opportunities to improve IT ROA spending by:

- Expanding the portfolio by acquiring new IT assets.
- Investing more in existing IT assets to generate greater value from them.
- Retiring obsolete or inefficient IT assets.
- Implementing controls to mitigate risk related to IT assets.

While there are many potential categories and attributes of IT assets, the three core ones are infrastructure, applications and information. Using this decision area, IT can analyze the inventory of physical IT assets (hardware, software, data sources and applications), their properties (such as vendor and direct cost) and their core capabilities (such as flexibility, scalability, reliability, compatibility and availability).

GOALS	METRICS	DIMENSIONS	
IT Capability Index	BI Users (#)	Application Software	IT Efficiency Opportunity
IT Costs (\$)	Employees (#)	Application Type	IT Savings Magnitude
IT Efficiency Index	IT Asset Availability Rating	Software	IT Savings Type
	IT Asset Compatibility Rating	Data Sources	IT Improvement Priority
	IT Asset Flexibility Rating	Data Source Type	IT Improvement Priority Rating
	IT Asset Reliability Rating	Data Source	IT Project Status
	IT Asset Scalability Rating	Decision Processes	IT Projects
	IT Direct Costs (\$)	Business Function	IT Project Type
	IT Indirect Costs (\$)	Decision Area	IT Project
	IT Project Costs (\$)	Discretionary Budget	IT Project
	IT Projects (#)	Reporting Period	Key Business Information
		Year	Business Subject Area
		Quarter	Metadata Model
		Month	Organization
		Goals/Metrics Hierarchy	Division
		Goal Type	Department
		Goals	Organization Code
		Metrics	Transaction Processes
		Information Supply Chain	Process
		Information Stage	Sub-Process
		Infrastructure Environment	Activity
		IT Technical Layer	
		IT Asset Type	
		IT Asset	

FUNCTION	DECISION ROLES	PRIMARY WORK	CONTRIBUTORY	STATUS
IT/Systems	Executives	*		
	Managers	*		
	Analysts	*		
	Professionals	*		
Finance	Executives			*
	Managers	*		
	Analysts	*		
<b>Customer Service, Risk Management, Services and Procurement</b>				
	Executives			*
	Analysts		*	
<b>Operations/Production</b>				
	Executives			*
	Analysts		*	
<b>Program Management</b>				
	Executives			*
	Analysts		*	
<b>Human Resources</b>				
	Executives			*
	Analysts		*	
<b>Audit</b>				
	Executives			*
	Analysts		*	
<b>General Management</b>				
	Executives			*

Improving IT efficiency, however, is not enough. Most organizations have tied 70 percent of their IT budget to nondiscretionary items. You can't cut these "keeping the lights on" costs easily. You can gain additional and invaluable insight in this decision area by comparing how diverse IT assets work together to support specific areas. Think of these IT assets as belonging to an information supply chain that acquires, manages and delivers access to information for end users. Thinking in terms of shared and integrated supply chains delivering information and functionality makes it easier to explain how improvements to incomplete, complex or obsolete IT assets represent greater effectiveness and value to the organization. IT should set standards and document the core metadata for the organization. Consistent metadata and rules are critical for information to become a trusted sweet spot in decision making processes.

## Project/SDLC Management

This decision area is one of two that make up IT's operational bread and butter. Value is generated from IT assets by implementing new software and infrastructure or developing new applications. With IT's discretionary budget for new projects limited to about one-third or less of the total IT budget, resources are scarce and expectations high. This makes good information even more critical. Most IT departments have hundreds of separate projects that are interrelated, overlapping or at various stages of completion. This decision area tracks the status of major projects against common project management milestones such as scope, requirements analysis, design specifications, development, testing, implementation and production. Monitoring on-time, on-budget, on-quality project indicators is critical to managing scope, unplanned changes and necessary adjustments. This information, which may need to be aggregated from several sources, also improves alignment around project priorities and helps flag duplication in purpose or scope.

GOALS	METRICS	DIMENSIONS	
IT Project Completion (%)	External Resource Days (EFT)	Business Scope	Project Start Date
IT Project Lead Time (#)	Internal Resource Days (EFT)	Reporting Period	Year
IT Project ROI (%)	Initiatives Rejected (#)	Year	Quarter
	IT Project Cost (\$)	Quarter	Month
	IT Project Value (\$)	Month	Contract End Date
	New Initiatives (#)	Forecast Scenario (Plan/Actual/Forecast)	Project Management
	Project Duration (#) – Business Days	Scenario	Project Team
	Project Duration (%) – Variance	Investment Range (\$)	Project Sponsor
	Rejection Causes (#)	IT Projects	Project Manager
	Total Resource Days (EFT)	IT Project Type	Project Member
		IT Project	Project Completion Date
		IT Project Status	Year
		IT Project Complexity	Quarter
		IT Project Milestones	Month
		IT Project Risk Level	Project Finish Date
			Related Projects
			Organization
			Division
			Department
			Organization Code

FUNCTION	DECISION ROLES	PRIMARY WORK	CONTRIBUTORY	STATUS
IT/Systems	Executives	*		
	Managers	*		
	Analysts	*		
	Professionals	*		
Audit	Executives			*
	Managers	*		
	Professionals	*		
Finance	Executives			*
	Analysts		*	
Customer Service	Executives			*
Services	Executives			*
Risk Management	Executives			*
Procurement	Executives			*
Operations/Production	Executives			*
Program Management	Executives			*
Human Resources	Executives			*
General Management	Executives			*

Contextual dimensions provide greater comparability across different projects. This allows for learning and sharing best practices between “apples and oranges” by pooling common information about different projects. These dimensions can include:

- Investment amount (< \$50K, < \$100K, < \$500K, > \$1M, etc.).
- Complexity (features, information, architecture).
- Dynamic versus static.
- Scope (point solution, departmental or agency).
- Critical skills required.
- Risk level (likelihood and impact assessments).

A key benefit of this information is that you gain insights even from failed projects. By seeing what worked and what didn't across many different projects and by ensuring a full life-cycle perspective on development projects, you can avoid future mistakes and resource misallocations. This information sweet spot helps manage expectations across the team, sponsors and stakeholders. With it, IT management can avoid project cost overruns, missed deadlines and sub-par quality deliverables. Beyond avoiding the adverse financial implications of failed projects, it also helps IT avoid the potentially serious impact on the organization's reputation and credibility.

## IT Vendor Management

This decision area represents the other operational information sweet spot for IT. In government agencies, IT spending on external vendors is significant in terms of dollars spent and strategic in terms of systems built and supported. IT needs a consolidated view of how much it is spending on IT assets, with whom and the return they are getting. The loss of services and hardware delivered and supported by third parties is long—from PCs and PDAs to routers and telecom services, from software licenses to system integrator services. Analyzing this information sweet spot helps identify what to consolidate and/or standardize to reduce costs and complexity. It also reveals where you can pool requirements to gain purchasing power or generate higher service levels. When this information is fragmented across the organization, it is difficult to spot duplication of contracts and agreements. Simple comparisons of vendor costs by function and user can help uncover potential excesses. Knowing that other vendors have provided similar products or services also helps IT foster healthy competition and price/quality comparisons.

GOALS	METRICS	DIMENSIONS	
IT Contract Cost (\$)	Credit Rating (#)	Application Software	IT Contract Start Date
IT Project Completion (%)	Employees (#)	Application Type	Year
IT Project Lead Time (#)	IT Asset Availability Rating	Software	Quarter
IT Vendor On-Time (%)	IT Asset Compatibility Rating	Data Sources	Month
SLA Performance (%)	IT Asset Flexibility Rating	Data Source Type	Contract Start Date
	IT Asset Reliability Rating	Data Source	IT Vendor Status
	IT Asset Scalability Rating	Reporting Period	IT Vendor
	IT Direct Costs (\$)	Year	IT Vendor Type
	IT Indirect Costs (\$)	Quarter	IT Vendor
	IT Project Costs (\$)	Month	Organization
	IT Projects (#)	Infrastructure	Division
	IT Vendor Hourly Rate (\$)	Environment	Department
	Quality Rating (#)	IT Technical Layer	Organization Code
		IT Asset Type	Transaction Processes
		IT Asset	Process
		IT Contract End Date	Sub-Process
		Year	Activity
		Quarter	
		Month	
		Contract End Date	

FUNCTION	DECISION ROLES	PRIMARY WORK	CONTRIBUTORY	STATUS
IT/Systems	Executives	*		
	Managers	*		
	Analysts	*		
	Professionals	*		
Audit	Executives			*
	Managers	*		
	Analysts		*	
	Professionals	*		
Finance	Executives			*
	Analysts	*		
Procurement	Executives			*
	Managers	*		
	Analysts		*	
	Professionals	*		
Customer Service	Analysts		*	
Services	Analysts		*	
Risk Management	Analysts		*	
Operations/Production	Analysts		*	
Program Management	Analysts		*	
Human Resources	Analysts		*	
General Management	Executives			*

This decision area is also important in managing service levels tied to major outsourcing contracts, a fixture for many IT functions. All service-level agreements have trade-offs between quality, time and cost. For large, complex, multiyear projects, earned value calculations help to assure that the project is on track and incremental value is being delivered, helping to avoid a surprise at the eleventh hour that the project is half completed and requires a radical injection of funds to keep the project going to completion.

Measuring quality, especially in the more complex Tier 3 contracts that manage and enhance applications, can be a challenge. For example, where Tier 1 agreements may measure service availability, numbers of incidents and resolution response times, Tier 3 agreements need to address access to and use of information from applications and how easy and quick it is to make changes. Even knowing when contracts are up for renewal, as well as when you are triggering penalty or incentive clauses, can lead to cost savings or improved service levels.

### IT Compliance Management

IT compliance management is increasingly a point of focus for government agencies. This decision area consolidates information from different compliance initiatives. As noted in Barrier 3, various frameworks and IT best practices such as COBIT and ITIL require general and application-specific IT controls. This decision area requires three common sources of information.

The first is from compliance program management software. Similar to the project/SDLC management decision area, this allows IT to ensure that compliance tasks take place and are meeting program milestones.

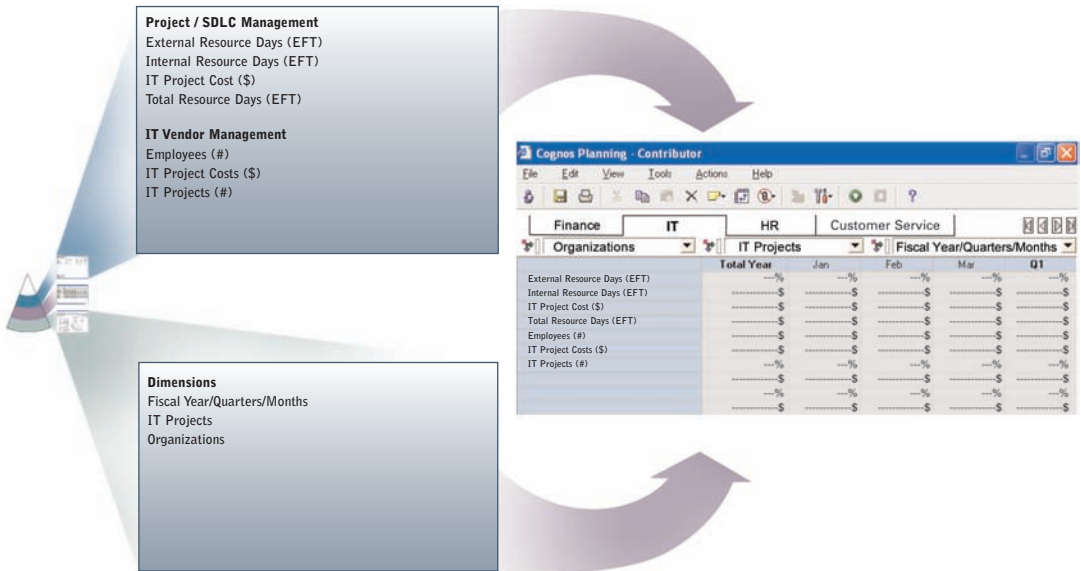
The second source of information comes from the controls themselves. There are 34 IT processes across four domains used in COBIT. A subset of these controls is required for regulatory compliance, notably around security and access controls, change and release management and incident and problem management. In most cases, these controls involve reviewing large volumes of data and flagging exceptions to established procedures.

GOALS	METRICS	DIMENSIONS	
Compliance Completion (%)	Control Effectiveness Rating	Application Software	In Scope
Compliance Costs (\$)	Controls (#)	Application Type	Infrastructure Environment
Material Deficiencies (#)	Exceptions (#)	Software	IT Technical Layer
Regulatory Compliance (%)	External Audit Fees (\$)	Assertions	IT Asset Type
Risk Level Index	Internal Audit Costs (\$)	Control Frequency	IT Asset
	Issues (#)	Control Method	IT Control Processes (COBIT)
	Items Overdue (#)	Control Objective	Control Type (App/Gen)
	Outsourced Internal Audit Costs (\$)	Control Owners	IT Domain
	Regulatory Audits	Function	IT Process
	Risk Impact Rating	Position	IT Control
	Risk Likelihood Rating	Control Owner	Key Control
	Sample Size (#)	Control Type	Remediation Status
	Significant Deficiencies (#)	Documentation Status	Risks
	Tests (#)	Entity	Risk Category
		Financial Account	Risk Type
		Financial Statement Type	Risk
		Financial Statement Line	Test Status
		Financial Account	Test Status
		Reporting Period	Transaction Processes
		Year	Process
		Quarter	Sub-Process
		Month	Activity

FUNCTION	DECISION ROLES	PRIMARY WORK	CONTRIBUTORY	STATUS
IT/Systems	Executives	*		
	Managers	*		
	Analysts	*		
	Professionals	*		
Regulatory/Compliance	Executives			*
	Managers	*		
	Analysts	*		
Audit	Executives			*
	Managers	*		
	Professionals	*		
Finance	Executives			*
	Analysts		*	
	Professionals		*	
Risk Management	Executives	*		
	Managers	*		
	Analysts	*		
	Professionals	*		
Legal	Executives			*
	Professionals		*	
Customer Service, General Management, Services, Procurement, Operations/Production, Program Management and Human Resources				
	Executive			*



The third source is metadata itself. Today, many organizations still have mostly manual internal controls. Approximately two-thirds or more are “detective” controls, versus the more reliable “preventive” ones. Detective controls involve reviewing transaction records in both detailed and summary form. For example, reviewing an accounts receivable trial balance is a detective control. In order for greater reliance to be placed on these controls, there must be a clear audit trail linking the source of information with the definitions and rules that apply. Being able to monitor and analyze which metadata governs which reports and who has access to it creates a more reliable control environment. It also supports the enforcement of existing data architecture standards.



*The Project / SDLC Management and IT Vendor Management decision areas illustrate how the IT function can monitor its performance, allocate resources and set plans for future financial and operational targets.*