# DON'T JUST LEAD, GOVERN: HOW TOP-PERFORMING FIRMS GOVERN IT [1]

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### Executive Summary

*Top-performing enterprises succeed in obtaining value from IT where others fail, in part, by implementing effective IT governance to support their strategies and institutionalize good practices. IT governance involves specifying decision rights and accountabilities for important IT decisions. The goal is to encourage "desirable behaviors" in the use of IT.*

*In studying the IT governance of more than 250 enterprises in 23 countries, we found a wide array of IT governance arrangements. Enterprises assign "decision rights" to different "archetypes" (Business or IT Monarchy, Federal, Duopoly, Feudal, or Anarchy) to govern five key IT decisions (IT investment, architecture, principles, application needs, and infrastructure).*

*Top-performing enterprises govern IT differently from each other and from average enterprises. Firms leading on growth decentralize more of their IT decision rights and place IT capabilities in the business units. Those leading on profit centralize more decision rights; senior business leaders make the major IT decisions. Top performers design their IT governance to reinforce their performance goals and link IT governance to the governance of their other key enterprise assets and desired behaviors. A case study of State Street Corporation illustrates IT governance evolution and a method to diagrammatically represent IT governance.*

## WHY IS IT GOVERNANCE IMPORTANT?[2]

IT governance matters because it influences the benefits received from IT investments. Through a combination of practices (such as redesigned business processes and well-designed governance mechanisms) and appropriately matched IT investments, top-performing enterprises generate superior returns on their IT investments. One estimate is up to 40% greater return than their competitors for the same IT investment.[3]
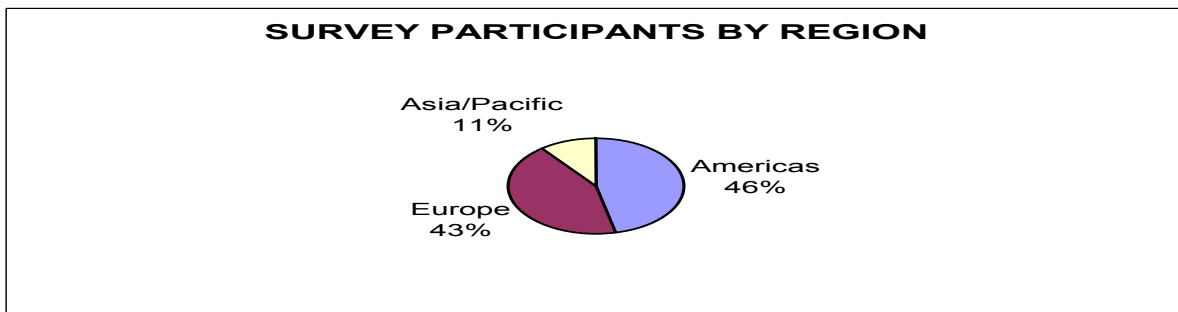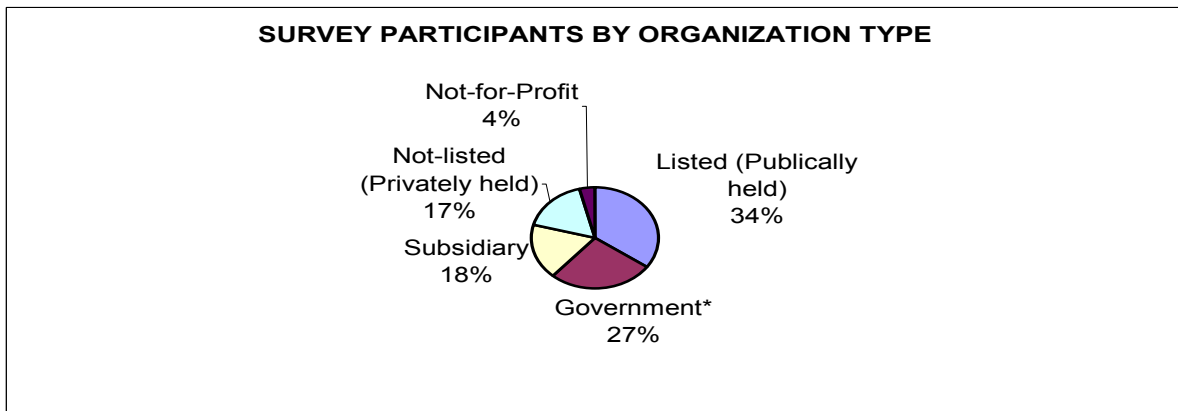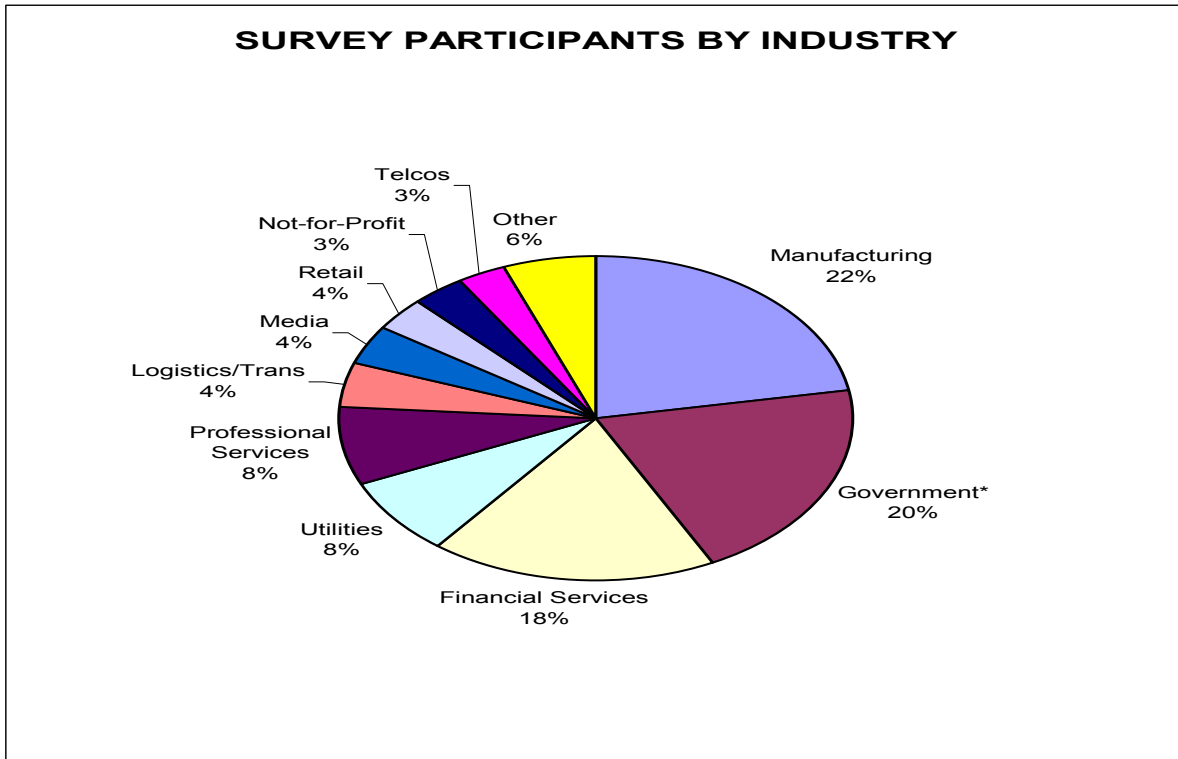
These top-performing enterprises proactively seek value from IT in at least five ways: (1) they clarify business strategies and the role IT plays in achieving them, (2) they measure and manage the amount spent and the value received from IT, (3) they design organizational practices to fit IT to their business strategies, (4) they assign accountability for the organizational changes required to benefit from new IT capabilities,

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[3] See: 1. Brynjolfsson, E., L. Hitt, et al. (2002). "Intangible assets: How the interaction of computers and organizational structures affects stocks market valuations," Brookings Papers on Economic Activity: Macroeconomics 1: 137-199 and 2. Peter Weill and Marianne Broadbent, *Leveraging the New Infrastructure: How market leaders capitalize on IT* (Boston, MA: Harvard Business School Press, 1998), Chapter 3.

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## Figure 1: Enterprises Studied By Survey

### SURVEY PARTICIPANTS BY INDUSTRY

- Telcos 3%
- Not-for-Profit 3%
- Retail 4%
- Media 4%
- Logistics/Trans 4%
- Professional Services 8%
- Utilities 8%
- Financial Services 18%
- Other 6%
- Manufacturing 22%
- Government* 20%

### SURVEY PARTICIPANTS BY ORGANIZATION TYPE

- Not-for-Profit 4%
- Not-listed (Privately held) 17%
- Subsidiary 18%
- Government* 27%
- Listed (Publically held) 34%

### SURVEY PARTICIPANTS BY REGION

- Asia/Pacific 11%
- Europe 43%
- Americas 46%

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and (5) they learn from each implementation, becoming more adept at sharing and reusing IT assets.

In part, top-performing enterprises succeed where others fail by implementing effective IT governance to support their strategies and institutionalize good practices. To understand how IT value is created, we studied IT governance in 256 enterprises with multiple business units—in for-profit and not-for-profit enterprises—in 23 countries in the Americas, Europe, and Asia Pacific (see Figure 1 for details).[4]

In addition to the correlation between firm performance and IT governance, we found that firms in the study with above-average IT governance performance that followed a specific strategy (such as customer intimacy) had more than 20% higher profitability[5] than firms with poor governance following the same strategy.

We define IT governance as *specifying the framework for decision rights and accountabilities to encourage desirable behavior in the use of IT*.[6]

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[4] This paper is derived from a series of research projects on IT governance led by Peter Weill at MIT Sloan Center for Information Systems Research (CISR): 1. In 2002, using an earlier version of the conceptual framework in this paper, we examined the IT governance and financial performance of 24 *Fortune 100* firms using data provided by Concours Group. 2. In 2002, the CIOs at 256 enterprises in 23 countries spanning the Americas, Europe and Asia Pacific—mostly Gartner EXP members—completed a survey designed by CISR. More than 95% of the respondents were CIOs with 89% of the sample having enterprise-wide responsibility. The instrument is available from CISR – please email dfitz@mit.edu. Financial data from the 117 of those firms listed on US stock exchanges was used by CISR to analyze the relationship between IT governance and firm performance. 3. From 2001 to 2003, a series of detailed case studies of 20+ firms was conducted by Marianne Broadbent and her colleagues at Gartner, Jeanne Ross or Peter Weill. For example, see: Marianne Broadbent and Peter Weill, "Effective IT Governance. By Design," January 2003 Gartner EXP Premier Report.

[5] Profitability is measured by three-year industry-adjusted average return on assets (ROA). Governance performance is the effectiveness of governance, as assessed by the CIO, to deliver four IT objectives weighted by importance: cost effective use of IT, effective use of IT for asset utilization, revenue growth, and business flexibility.

[6] There are a number of other interesting definitions and sources of information on IT governance that are generally consistent in purpose with our definition, but they differ in form. For example, see the IT Governance Institute (www.itgi.org), which defines IT Governance as "A structure of relationships and processes to control the enterprise in order to achieve the enterprise's goals by adding value while balancing risk versus return over IT and its processes." This definition is from the IT Governance Institute's "COBIT 3rd Edition Executive Summary of July 2000." The COBIT model describes the "control objectives" for 34 IT processes and the management guidelines and outcome measures for these processes. COBIT also proposes a five-stage maturity model of IT governance and a series of toolkits, audit guidelines, and education offerings to support use of the frameworks. The materials are detailed and comprehensive, and are very operationally focused around implementation and control. Another definition and perspective is by Wim Van Grembergen: "IT governance is the organizational capacity exercised by the Board, executive management, and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT." (Wim Van Grembergen, "Introduction to the minitrack: IT Governance and its mechanisms,"

A desirable behavior is one that is consistent with the organization's mission, strategy, values, norms, and culture, such as behavior promoting entrepreneurship, sharing and reuse, or relentless cost reduction.

IT Governance is not about what specific decisions are made. That is management. Rather, governance is about systematically determining who makes each type of decision (a decision right), who has input to a decision (an input right), and how these people (or groups) are held accountable for their role. Good IT governance draws on corporate governance principles to manage and use IT to achieve corporate performance goals. Effective IT governance encourages and leverages the ingenuity of all enterprise personnel in using IT, while ensuring compliance with the enterprise's overall vision and principles. As a result, good IT governance can achieve a management paradox: simultaneously empowering and controlling.

All enterprises have IT governance. The difference is that enterprises with effective governance have actively designed a set of IT governance mechanisms (e.g., committees, budgeting processes, approvals, IT organizational structure, chargeback, etc.) that encourage behaviors consistent with the organization's mission, strategy, values, norms, and culture. In these enterprises, when the "desirable behaviors" change, IT governance also changes.

For example, David Spina, CEO of State Street Corporation, a world leader in global investor services, defined the firm's corporate vision in 2001 as 'One State Street." This vision shifted the orientation of the enterprise from business units (such as investment research and management, trading and brokerage services, fund accounting, and custodial services) to a customer orientation. The goal was to make organizational lines invisible to customers. Thus, desirable behaviors shifted to optimizing enterprise-wide as well as business-unit objectives. State Street established and refined a set of governance mechanisms, including enterprise-wide IT budgeting and an Office of IT architecture, to encourage these new behaviors.[7] We will return to the case study of State Street Corporation in a later section.

IT governance cannot be considered in isolation because it links to the governance of other key enterprise assets (such as financial, human, intellectual property,

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35th HICSS conference -http://computer.org/proceedings/ hicss/1874/track8/187480242.pdf).

[7] Source: Peter Weill and Richard Woodham, "State Street Corporation: Evolving IT Governance." Working Paper no. 327, MIT Sloan School Center for Information Systems Research, Cambridge, revised August 2002.

| Figure 2: Five Major IT Decisions Need to be Made | | |
|---|---|---|
| **IT Principles** | High-level statements about how IT is used in the business | Davenport, Hammer & Metsisto 1989, Broadbent & Weill 1997 |
| **IT Architecture** | An integrated set of technical choices to guide the organization in satisfying business needs. The architecture is a set of policies and rules for the use of IT and plots a migration path to the way business will be done (includes data, technology, and applications) | Keen 1995, Ross 2003 |
| **IT Infrastructure Strategies** | Strategies for the base foundation of budgeted-for IT capability (both technical and human), shared throughout the firm as reliable services, and centrally coordinated (e.g., network, help desk, shared data) | Keen 1989, Weill, Subramani & Broadbent 2002 |
| **Business Application Needs** | Specifying the business need for purchased or internally developed IT applications | Earl 1993 |
| **IT Investment And Prioritization** | Decisions about how much and where to invest in IT including project approvals and justification techniques | Devaraj & Kohli 2002, Ross & Beath 2002 |

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etc.). Governance of the key assets, in turn, links to enterprise governance and desirable behaviors.

The stimulus to study IT governance came, in part, from two sources. First, we were motivated by the stock-market premiums given to firms with excellent *corporate* governance.[8]  We suspected a similar premium existed for excellent *IT* governance. Second, we believed that the relatively sophisticated financial governance in most enterprises could provide a good model for IT governance. CFOs don't make every financial decision or sign every check. Instead they design governance to identify who can make financial decisions and how these people are held accountable. In addition, CFOs have tools to manage the investment portfolio, risk profile, cash flow, and leading and lagging indicators of performance. The same approach can be applied to IT governance.

## THE KEY IT DECISIONS AND ARCHETYPES FOR IT GOVERNANCE

Managers make hundreds of decisions a week—some after careful analysis and others as part of their daily frenetic activity. Governance design and analysis requires stepping back from day-to-day decision making and focusing on identifying the fundamental decisions to be made and who should make them. We propose that large enterprises have five major IT decisions to make (see Figure 2) and use six mutually exclusive governance archetypes (Figure 3) for making these decisions.

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[8] Roberto Newell and Gregory Wilson, "A Premium for Good Governance" *The McKinsey Quarterly*, No. 3 (2002): 20–23.

## Figure 3: IT Governance Archetypes

| **Decision rights or inputs rights for a particular IT decision are held by:** | | CxO Level Execs | Corp. IT and/or Business Unit IT | Business Unit Leaders or Process Owners |
|---|---|---|---|---|
| **Business Monarchy** | A group of, or individual, business executives (i.e., CxOs). Includes committees comprised of senior business executives (may include CIO). Excludes IT executives acting independently. | ✓ | | |
| **IT Monarchy** | Individuals or groups of IT executives. | | ✓ | |
| **Feudal** | Business unit leaders, key process owners or their delegates. | | | ✓ |
| **Federal** | C level executives and at least one other business group (e.g., CxO and BU leaders)—IT executives may be an additional participant. Equivalent to a country and its states working together. | ✓ | ✓ | ✓ |
| | | ✓ | | ✓ |
| **IT Duopoly** | IT executives and one other group (e.g., CxO or BU leaders). | ✓ | ✓ | |
| | | | ✓ | ✓ |
| **Anarchy** | Each individual user | | | |

Each of these major IT decisions has been the subject of many articles and books.[9] Rather than attempt to do justice to the details of each decision here, references to citations are provided in Figure 2 with details in the footnote.[10]

Drawing on work on corporate governance, state governance, and information politics, we use political archetypes (monarchy, feudal, federal, duopoly, anarchy) to describe the combinations of people who have either decision rights or input rights to IT decisions.[11] Each of our six archetypes (described in Figure 3) can hold decision rights or input rights to each of the five key IT decisions. Governance can (and should) be

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[9] For an overview see: 1. James D. McKeen and Heather A. Smith, *Making IT Happen: Critical Issues in IT Management* (Chichester, West Sussex, England: Wiley, 2003). 2. Robert W. Zmud, ed., *Framing the Domains of IT Management: Projecting the Future…Through the Past* (Cincinnati: Pinnaflex, 2000).

[10] 1. Principles: a. Thomas H. Davenport, Michael Hammer and Tauno J. Metsisto. "How Executives can Shape their Company's Information Systems." *Harvard Business Review*, March-April 1989, 130-134. b. M. Broadbent and P.Weill, "Management by Maxim: How business and IT managers can create IT infrastructures," *Sloan Management Review*, Vol. 38, No. 3, Spring 1997, pp. 77–92; **2**. Architecture: a. Keen, Peter G.W., *Every Manager's Guide to Information Technology.* 2nd Edition, Boston, MA: Harvard Business School Press, 1995. b. Jeanne Ross "Creating a Strategic IT Architecture Competency: Learning in Stages," MISQE, Vol. 2, No.1, March 2003; 3. Infrastructure Strategies: a. Keen, Peter G.W., *Shaping the Future: Business Design Through Information Technology*, Harvard Business School Press, Cambridge, MA, 1991; b. Peter Weill, Mani Subramani and Marianne

Broadbent "Building IT Infrastructure for Strategic Agility," *Sloan Management Review*, Vol. 44, No 1 (Fall 2002), 57–65; **4**. Application Needs: Earl, M.J. "Experiences in Strategic Information Systems Planning," *MIS Quarterly*, 17 (1993), pp. 1-24; **5**. IT Investment and Prioritization: a. "Sarv Devaraj and Rajiv Kohli, *The IT Payoff: Measuring the Business Value of IT Investments*, Financial Times Prentice Hall, New Jersey USA, 2002. b. Jeanne W. Ross and Cynthia M. Beath, "Beyond the Business Case: New Approaches to IT Investment," *MIT Sloan Management Review*, Vol. 43 No. 2 (Winter 2002), 51-59.

[11] For an excellent discussion of the political perspective and the source of several of these archetypes, see Chapter 5 of T. Davenport and L. Prusak, *Information Ecology: Mastering the information and knowledge environment*, Oxford University Press, 1997.

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designed and assessed at several levels in a large enterprise, such as enterprise-wide, by business unit, and perhaps by region or group of business units. This paper focuses on enterprise-wide analysis, but the same approach can be used at other organizational levels.

## Business Monarchy

In a business monarchy, senior business executives make IT decisions affecting the entire enterprise. At State Street Corporation, the COO, CIO, chief administrative officer (CAO), and senior executives leading the various business units make up an executive committee. The CIO participates as an equal partner with the other leaders. The senior business executives (the CxOs or sometimes called the "C" level executives) make the IT decisions as a group.

Typically, business monarchies receive input for key decisions from many sources. For example, input for IT investment decisions at many enterprises, including State Street, come from: (i) the CIO's direct reports, (ii) the business units, through the IT leadership team, (iii) the enterprise-wide IT budget management process, (iv) service level agreements and chargeback, and (v) an activity tracking system showing all IT resources and how they are deployed.

## IT Monarchy

In an IT monarchy, IT professionals make the IT decisions. At UPS, for example, the IT governance committee, which consists of senior IT managers, makes the strategic decisions that impact IT architecture.

Enterprises implement IT monarchies in many different ways, often involving IT professionals from both corporate teams and business units. DuPont has an enterprise IT architecture group with representatives from all regions, all strategic business units, and all competency centers. This group proposes architecture "rules" to the senior IT management team, which consists of the corporate CIO and the CIOs of the largest business units. This team makes sure the rules make sense for the business, and it takes responsibility for enforcing architectural standards.

## Feudal

The feudal model is based on the traditions of "merrie olde" England, where each prince and princess, or their designated knights, make their own decisions to optimize their local needs. For IT governance, the feudal estate is typically the business unit, region, or function. Overall, the feudal model in our study was not very common because most enterprises were looking for synergies across business units.

## Federal

The federal decision-making model has a long tradition in government. Federal arrangements attempt to balance responsibilities and accountabilities of multiple governing bodies spanning at least two hierarchical tiers, such as country and states. Charles Handy and other management writers have identified the usefulness of the federal model in negotiating the interests of both the entire enterprise and individual business units.[12]

We define the federal model as coordinated decision making involving both a center and its business units (at least two levels of the business hierarchy). Business-unit representatives in a federal model can be either business unit leaders or business process owners, or both. IT leaders, either from business units or corporate, may also participate. In these cases, they add to the federal group, they do not take the place of one of the business groups.

The federal model is probably the most difficult archetype to use for decision making because enterprise leaders have different perspectives from business unit leaders. Enterprise-wide requirements can, and often do, clash with business unit requirements, requiring compromises to foster concurrence. In addition, incentive systems often focus managers' attention on business unit results rather than enterprise results. The impact of shared resources on business unit performance—and specifically the transfer prices charged for those resources—typically raises concerns about fairness.

## IT Duopoly

The IT duopoly is a two-party arrangement where decisions represent agreement between IT executives and one business group.[13] The IT executives may be any combination of IT groups. The business group is typically CxOs, business unit leaders, or business process owners.

An IT duopoly *always* includes IT representation (one part of the duo) and business representation (the second part of the duo)—but only one group of business representatives in each duopoly (typically a business unit or the group CxOs). The federal arrangement always has two or more levels of the business hierarchy

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[12] For an excellent discussion of the federal model of organizations, see Charles Handy, "Balancing Corporate Power: A New Federalist Paper," *Harvard Business Review*, November-December 1992, 59–72.

[13] By duopoly, we mean "control or domination by two persons or groups" as defined by the Oxford English Dictionary, Second Edition 1989, http://dictionary.oed.com/cgi/entry/00070944?single=1&query_type=word&queryword=duopoly&edition=2e&first=1&max_to_show=10 (accessed 30 May 2003).

involved, so it generally has both corporate and local business representation (typically more than one business unit).

Over a third of the 256 enterprises used IT duopolies to make decisions in the three less technical IT decisions: IT principles, business application needs, and IT investments. The duopoly archetype is popular partly because it involves only two decision parties. Duopolies can achieve many of the objectives of a federal model using a simpler two-way rather than multi-way decision-making structure.

Similarly, an IT duopoly has the advantage over the feudal model that the central IT group is usually one of the few groups that sees the enterprise as a whole and can look for opportunities for sharing and reuse among business groups and business units. The IT professionals can also manage adherence to the enterprise's IT architecture, either overtly or covertly.

IT duopolies often rely on relationship managers or business unit CIOs to represent business unit needs. A corporate IT group can have a duopoly with each different business unit (a hub and spoke model) enabling more tailored decisions in less time. Each of these duopolies also has the advantage of focusing directly on the needs of its business unit, resulting in higher business unit satisfaction. But having an IT duopoly with each business unit can be expensive and ineffective when organization-wide issues are being decided.

### Anarchy

Within an anarchy, individuals or very small groups make their own decisions based only on their own needs. They differ from feudal decision makers in the size of their organization. Feudals speak for larger groups; anarchists speak for smaller groups, often only themselves.

Anarchies are the bane of many IT organizations because they go their own way, and they are expensive to support and make secure. Formally sanctioned anarchies were rare in our study. But they did exist, and were supported, where local or individual customers required very rapid IT responsiveness.

## HOW FIRMS GOVERN IT

For the enterprise as a whole, we studied both who held decision rights and input rights for each of the five decisions. We then categorized the enterprise's approach by archetype. Figure 4 shows three results. One, the numbers in the cells show the percentage of enterprises that used each governance archetype for each decision. The percentages in each column add to 100%. Two, to assist readability the darker shaded cells indicate the most common decision and input rights for each decision (the highest percentages in a column). Three, the cells with shaded borders show the most common decision rights.

### Input Rights

The most common input rights are broad-based (that is, they involved many people), while the decision rights are held by different groups for each decision. For the three more business-oriented IT decisions (i.e. IT principles, business application needs, and IT investments), more than 80% of the enterprises use the federal model for input rights. Committees, budgets, and cross-functional process teams provide the opportunities for input and feedback on these IT decisions. For the more technical IT decisions (IT architecture and infrastructure strategies), input rights vary more, at least at the enterprise level discussed in this paper. Duopoly is generally second most common to federal input rights.

In addition to collecting internal input for decisions, many firms also look externally. Vendors, business partners, consultants, industry associations, universities, and other groups provide input. Compared to input processes, decision rights are much less uniformly managed across different enterprises.

Given the little variation in input rights, the rest of this paper focuses only on decision rights.

### Decision Rights

***For IT principles.*** IT principles set the strategic role for IT across the enterprise and are decided in a variety of ways. Some 36% of the enterprises use a duopoly approach, although business and IT monarchies and federal approaches are also regularly used.

We suspect that duopolies (where business and IT are involved one-on-one) have gained favor in setting IT principles because senior executives sense that they must take the lead to ensure that IT aligns with business strategies. Working in partnership with IT leaders in the decision process establishes realistic expectations for IT and forces clarification of business strategy. A duopoly also secures the IT unit's commitment to business principles. Just as important, senior executives allow IT to shape business principles by reflecting IT capabilities already in place or under development in those principles.

## Figure 4: How do enterprises govern?

| | | Decision Domain | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | IT Principles | | IT Architecture | | IT Infrastructure Strategies | | Business Application Needs | | IT Investment | |
| | | Input | Decision | Input | Decision | Input | Decision | Input | Decision | Input | Decision |
| Governance Archetype | Business Monarchy | 0 | 27 | 0 | 6 | 0 | 7 | 1 | 12 | 1 | 30 |
| | IT Monarchy | 1 | 18 | 20 | 73 | 10 | 59 | 0 | 8 | 0 | 9 |
| | Feudal | 0 | 3 | 0 | 0 | 1 | 2 | 1 | 18 | 0 | 3 |
| | Federal | 83 | 14 | 46 | 4 | 59 | 6 | 81 | 30 | 93 | 27 |
| | Duopoly | 15 | 36 | 34 | 15 | 30 | 23 | 17 | 27 | 6 | 30 |
| | Anarchy | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 1 |
| | No Data or Don't Know | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 |

Most common pattern for all firms

The numbers in each cell are percentages of the 256 enterprises studied in 23 countries. The columns add to 100%.

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***For IT architecture.*** Over 70% of enterprises rely on IT monarchies to make IT architecture decisions, suggesting that senior business executives view architecture more as a technical issue than as a strategic business issue. Most enterprises attempt to consider business strategy in architecture decisions through their federal and duopoly input rights. However, the dominant decision-making role of IT in architecture decisions suggests that business managers feel unqualified, uninterested or unneeded—they are confident that IT professionals can translate IT principles into an architecture. IT professionals are typically quite comfortable taking responsibility for architecture decisions. At many of the enterprises we have studied, an IT-only team—often with IT representatives from numerous business units—is responsible for designing and managing the IT architecture, which the team then communicates to the entire enterprise.

***For IT infrastructure strategies.*** Like architecture, IT infrastructure strategy decisions are often made by IT only. Almost 60% of enterprises use IT monarchies to make infrastructure decisions. Johnson & Johnson's Networking and Computing Services (NCS) unit, for instance, provides centralized infrastructure services for many of J&J's operating units. However, because NCS must effectively sell its services to the operating

companies, it is strongly influenced by the demands of its customers. At J&J, the IT staff at the operating companies most often articulate these demands. At many enterprises, however, significant input comes from federal and duopoly arrangements.

Effective IT monarchies design infrastructures to anticipate and support the application requirements of business units. Well designed, the infrastructure enables the soon-to-be-needed applications. Poorly designed, the infrastructure is a frustrating barrier to the business units. Some enterprises involve business leaders in these infrastructure decisions (e.g. duopoly) to make them more successful effectively reducing the risk to IT.

***For business application needs.*** Firms choose the federal model to make business application needs decisions so that enterprise objectives are included in the process of deploying local applications. Using the federal model, for instance, a firm may decide either to replicate or customize enterprise-wide software for the local level. For example, one pharmaceutical firm purchased an ERP system for the entire enterprise. But, except for a small set of firm-wide data definitions (e.g. financial data), it did not standardize the application across its regional business units. Rather,

the central ERP team developed a model, and then helped local teams configure the system to fit their unique needs. This arrangement allowed for shared expertise across the firm, but regarded the benefits of local customization more important than global standardization.

Business application needs are the only decision where a significant number of enterprises (18%) use a feudal model—independent business units make their own decisions.

*For IT investment and prioritization*. Enterprises make IT investment and prioritization decisions using three archetypes about equally—business monarchy, federal, and duopoly. These three offer different models of how enterprises aim to maximize the value of their IT investments. Business monarchies use top-down decision making to implement a change in strategy. A federal model is typically used where agreement (or consensus) is needed between the center and the business units to achieve enterprise goals, for example, to balance flexibility of the business units with using standard practices across the enterprise. Duopolies are used, for example, where bilateral decisions (between IT and each business unit in a hub and spoke model) satisfy the individual needs of the business units while they share IT services. In a duopoly, the IT group plays an important facilitating role, and consensus is typically not needed across the business units.

Only 9% of enterprises place IT investment decisions in the hands of IT professionals, which reflects the growing awareness that these decisions involve business tradeoffs. The business decision makers realize they need to determine which business processes will receive IT support and which will not.

## PATTERNS OF IT GOVERNANCE

Our study reveals some broad patterns of IT governance. For example, few enterprises govern IT using the anarchy or feudal approaches. We found that the variations in governance patterns result mainly from the following five factors:

1. **Strategic and performance goals**: Effective governance attempts to reinforce specific desirable behaviors to achieve the enterprise's strategic and performance goals.

2. **Organizational structure**: Traditionally, enterprises have relied on organizational structure to align decision making with enterprise goals and strategies. However, as enterprises attempt to address competing goals, expanding geographies,

rapid change, and intense competition, organizational structures have proven to be inadequate support for strategy. Enterprises now design governance to compensate for the limitations of structure, in part, to require less change in structure as business needs change. For example, cross-regional committees can aim for greater standardization without having to create a new organizational level in the enterprise.

3. **Governance experience**: Many enterprises are relatively early in the IT governance learning curve. As their experience increases, they change their IT governance.

4. **Size and diversity**: As enterprises grow and diversify—both geographically and organizationally—they introduce competing, and even conflicting, objectives. IT governance reflects these changes.

5. **Industry and regional differences**: Industry and regional differences create unique pressures on enterprises that are reflected in their IT governance. Decision-making cultures vary considerably across different regions of the world, often complicating governance in global enterprises. For example, the not-for-profit and government sectors use significantly more business monarchies for IT principles and IT investment than for-profit enterprises. This heavier use of business monarchies reflects the more centralized decision-making processes in some types of government and not-for-profit enterprises (e.g. emergency response, taxation, defense, etc.).[14]

## AN IT GOVERNANCE FRAMEWORK

One of the challenges in implementing good IT governance is describing and communicating it to IT and non-IT personnel. The 256 CIOs surveyed reported that 38% of their "senior management colleagues in leadership positions could accurately describe their IT governance." This factor turns out to be the most important predictor (i.e., largest statistical correlation) of high governance performance.[15]

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[14] Tables showing industry and regional differences among the enterprises in our study are available at the following Web site – http://web.mit.edu/cisr/ITGovBookReferenceLinks.htm.

[15] Governance performance is the effectiveness of governance assessed by the CIO to deliver four IT objectives weighted by importance: cost effective use of IT & effective use of IT for asset utilization, revenue growth, and business flexibility. Adding confidence to the measure, governance performance has statistically significant positive relationship with several three-year-average measures of industry-adjusted financial performance (i.e. ROE, market cap growth).

Segmenting the enterprises into top and bottom performers revealed big differences. Half the managers in the top 50% of governance performers could describe governance while fewer than 30% of managers could do so in poorer performers. The higher the percentage of managers who can describe IT governance, the higher the governance performance. When more managers can accurately describe governance, it is more likely to be part of the enterprise's management culture and thus followed—or better still—challenged and improved. Without awareness of IT governance, there is no chance it will be followed.

To aid in presenting, analyzing, and communicating IT governance, we developed the IT Governance Arrangements Matrix, which is illustrated via a short case study of IT governance evolution at State Street Corporation.

## Case Study: State Street Corporation

State Street Corporation is a world leader in financial services, providing investment services, investment management, trading, and research to investment managers, corporations, mutual funds, pension funds, unions, not-for-profit organizations, and individuals. As of March 2003, State Street had $7.9 trillion in assets under custody and $788 billion in assets under management. Over 20,000 employees worked out of 22 countries serving clients in over 100 markets. From 1996 to 2002, State Street's revenue and net income grew at a rate of over 15% a year. In 2002, State Street had total revenues of nearly $4 billion and net income of $719 million.

When David Spina became Chairman and CEO of State Street in January 2001, the world's stock markets were in a prolonged slump and a series of structural changes were occurring in State Street's core markets. These changes led State Street to focus on achieving greater returns from all assets, particularly from the IT investments crucial to State Street's leadership position.

Traditionally, State Street operated as a set of separate business units. But in response to these and other changes, David Spina articulated his client-focused vision of "One State Street." At internal meetings during 2001, Spina explained:

> *"You've heard me talk about 'One State Street.' That term describes how we must work together to serve our clients. When clients look at State Street, our organizational lines must be completely invisible, and behind this seamless face, we must have industrial-strength lines of communication connecting every part of the company."*

To deliver 'One State Street' required a single point of contact and consistent client view of State Street – to develop new business and to reduce time to market. State Street management believed shared IT infrastructure was important to enable this single point of contact. Historically, State Street's IT organization had been highly decentralized. The CIO of State Street recognized the firm needed new IT governance to facilitate these changes. The new governance design is summarized in Figure 5.

State Street's new governance arrangement focuses on the firm's requirements for customer intimacy and synergy across autonomous business units. A business monarchy makes IT principles and IT investment decisions. IT monarchies assume responsibility for the more technical IT decisions of infrastructure and architecture, receiving broad-based federal input for IT infrastructure. Business application decisions are made via a duopoly that includes business unit leaders, IT professionals from the business units (vertical IT groups), and IT shared services (horizontal IT groups). This model provides for both business-unit and enterprise-wide perspectives in IT governance decisions.

The key mechanism for implementing State Street's business monarchy is the IT Executive Committee (ITEC), comprised of the COO, CAO, CIO, and senior executives from State Street's various business units. ITEC is responsible for reviewing, analyzing, and synthesizing the IT investment needs of individual business units to create an enterprise-wide IT budget. Once ITEC has decided on the list of projects, the IT organization tracks the allocation and use of the IT budget by project and business unit using an activity tracking system.

The IT monarchies for infrastructure and architecture rely on two mechanisms: the IT Leadership Group (ITLG) and the Office of Architecture. The ITLG, composed of all senior business-unit and corporate IT managers, defines IT strategy. The mission and methodology of the Office of Architecture have been codified in a set of IT Architecture Principles, which link technology to the business.

Early evidence suggested that State Street's IT governance structure encouraged desirable behaviors. For example, testimonials from project managers indicated that the architectural review process helped deliver solutions more quickly because technology issues surfaced before they critically impacted projects. The shared infrastructure was evolving to address the joint needs of the businesses. These changes facilitated desirable behavior for "One State Street." The IT governance structure enabled consolidation of the IT in-

## Figure 5: State Street IT Governance Matrix

| Governance Archetype | IT Principles | | IT Architecture | | IT Infrastructure Strategies | | Business Application Needs | | IT Investment | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Input | Decision | Input | Decision | Input | Decision | Input | Decision | Input | Decision |
| **Business Monarchy** | | • ITEC | | | | | | | | • ITEC<br>• CIO |
| **IT Monarchy** | | | • Arch Office | • CIO<br>• IT Leaders | | • CIO<br>• IT Leaders | | | | |
| **Feudal** | | | | | | | | | | |
| **Federal** | • CIO<br>• IT Leaders<br>• Biz Leaders<br>• IT Org | | | | • IT Org<br>• Arch Office<br>• Biz Leaders | | | | • Budgets<br>• SLA<br>• Activity Tracking<br>• IT Leaders | |
| **Duopoly** | | | | | | | • ITEC<br>• Budgets | • Biz Leaders<br>• IT ORG<br>• IT Leaders | | |

Most common patterns for all firms ▮

### Governance Mechanisms

| | | | |
|---|---|---|---|
| **ITEC** | *Information Technology Executive Comm.* | **SLA** | *Service Delivery Agreements and Chargebacks* |
| **ARCH Office** | *Office of Architecture* | **IT ORG** | *Federal IT Organization* |
| **CIO** | *CIO Staff* | **Activity Tracking** | *Activity Tracking System* |
| **IT Leaders** | *IT Leadership Group* | **Budgets** | *Enterprise Wide IT Budget Mgmt* |

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frastructure, resulting in significant cost savings and cost avoidance while still facilitating new offerings to clients, such as custom data marts.

This case illustrates good IT governance. Governance changed as State Street evolved from a set of independent business units to "One State Street," and more recently to a firm operating in a period of a declining stock market. State Street has used IT governance explicitly to encourage the desirable behaviors needed to implement its strategies.

## HOW TOP PERFORMERS GOVERN IT

To understand how top performers govern IT, we identified two types of top performers: top IT *governance* performers and top *financial* performers.

Top IT *governance* performers are those firms where the CIO rates their IT governance as effective by weighting delivery of four objectives by their importance to the enterprise:

1) Cost effective use of IT

2) Effective use of IT for asset utilization

3) Effective use of IT for growth

4) Effective use of IT for business flexibility.[16]

Top *financial* performers are those firms with high financial performance. Financial performance is assessed by comparing three-year averages of industry-adjusted measures of profit (ROE), growth (% change in revenue) and asset utilization (ROA).[17]

## How Top IT Governance Performers Govern IT

Firms where the CIO rates IT governance performance highly typically use IT duopolies for both IT principles and investments.[18] These two decisions are the most strategic of the five key IT decisions. Principles set the role for IT in the enterprise and investments establish the level of commitment and priorities. IT duopolies work well for these decisions because they enable joint decision making between the business leaders and IT professionals, but remain focused on the specific and often local issues facing the business leaders. Some IT and business process standards may be nonnegotiable, but the IT duopoly approach allows for creative business solutions within agreed-upon constraints.

There are no dominant IT governance patterns exhibited by top governance performers for the other three decisions.

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[16] The questionnaire asked CIOs about these 4 objectives: "How important are the following 4 outcomes of your IT governance, on a scale from 1 (Not Important) to 5 (Very Important). The respondents then rated "what was the influence of the IT governance in your business on the following 4 measures of success, on a scale from 1 (Not Successful) to 5 (Very Successful). Using the following formula, a weighted average score for governance performance was calculated from a questionnaire.

Governance performance=

$$\frac{\Sigma_{n=1 to 4}(\text{importance of outcome \{Factor 1\}} * \text{influence of IT governance\{Factor 1\}})*100}{\Sigma_{n=1 \text{ to } 4} (5(\text{importance of outcome}))}$$

Since there were four objectives, the maximum score is 100 and the minimum score is 20. The average score from 256 enterprises was 69, with the top one-third enterprises scoring over 74.

[17] These performance metrics were chosen to represent a basket of measures many firms seek to achieve. The following sources summarize many studies that measure firm performance that influenced our choice of measures and provide excellent references: 1. Noel Capon, John U. Farley and Scott Hoenig. "Determinants of Financial Performance: A Meta-Analysis" *Management Science*, Vol. 36, No. 10 (1990), 1143–1159 (A focused issue on the state of the art in theory and method in strategy research); 2. David J.Ketchen Jr., James B. Thomas, Charles C. Snow. "Special Research Forum: Configurational Approaches to Organization Organizational Configurations and Performance: A Comparison of Theoretical Approaches," *The Academy of Management Journal*, Vol. 36, No. 6. (December 1993), 1278–1313; and 3. The Encyclopedia about Corporate Governance, http://www.encycogov.com.
[18] Based on statistically significant correlations between governance performance and each archetype considered separately.

The poorer governance-performing enterprises typically use federal arrangements for their decision making. Many factors explain why federal models are less effective for decision making, including slower speed and a tendency to overly compromise and trade away effectiveness. Federal decision making often takes longer as more people and stages are involved, and there is less agreement on the objectives for the decisions. The long cycle times compound the problems faced by enterprises with poor governance. They continue to perform poorly until intervention occurs. Worse still, when compromises are made to "keep everybody happy," neither the business units nor the enterprise achieves what is really needed.

While federal decision making is generally less effective, a few enterprises have overcome its limitations by establishing enterprise success as an important goal for all managers.
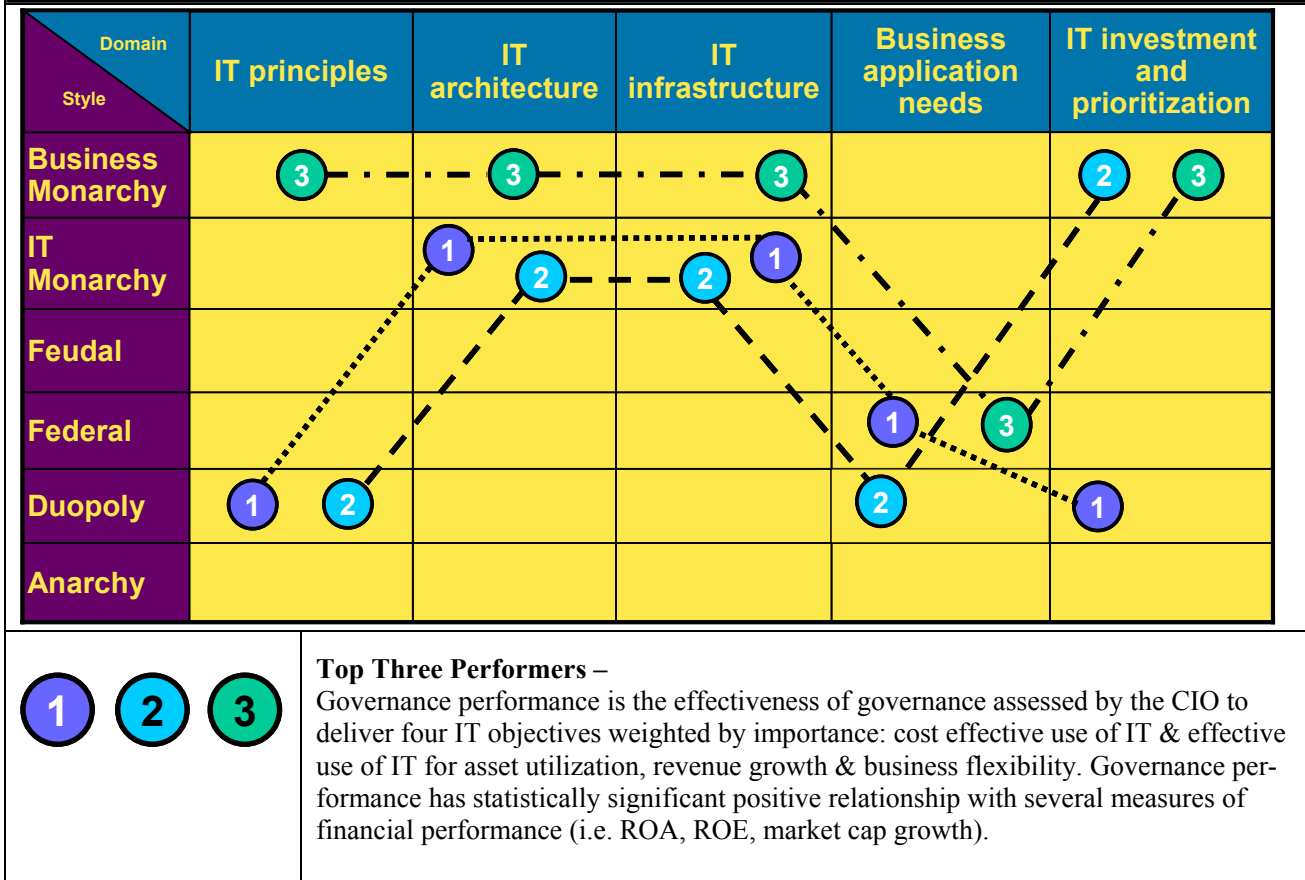
Federal decision making predicted poorer performance in all decisions except applications needs. For business application needs, the federal approach can work well if decision makers are rewarded for achieving both enterprise and business unit objectives and they can distinguish shared needs from unique application needs. The poorer governance-performing enterprises typically used feudal models for deciding on their business application needs.

## Three Effective It Governance Patterns

We found significant variation in IT governance arrangements among the 256 firms. Each of the five key IT decisions has a choice of six governance archetypes, yielding thousands of possible combinations. The ten most popular combinations account for 25% of the enterprises. Within these ten, the three most effective arrangements, as measured by IT governance performance, are presented in Figure 6.

1. Arrangement 1 uses duopolies for principles and investment, IT monarchies for infrastructure and architecture, and federal for business application needs. This arrangement requires IT groups that are finely tuned to business needs, with a strong level of trust between the business and IT. The federal model for application needs can capitalize on potential synergies (such as common customers) across business units.

Figure 6: Top Three Overall Governance Performers

Top Three Performers –
Governance performance is the effectiveness of governance assessed by the CIO to deliver four IT objectives weighted by importance: cost effective use of IT & effective use of IT for asset utilization, revenue growth & business flexibility. Governance performance has statistically significant positive relationship with several measures of financial performance (i.e. ROA, ROE, market cap growth).

2. Arrangement 2 is similar, using a duopoly for application needs and a business monarchy for investment. For enterprises with few synergies, using a duopoly for application needs can work well because there is less need to coordinate across business units. Arrangements 1 and 2 are both good starting points for enterprises balancing growth and profitability because the tensions of business units seeking to meet their local customer needs are nicely balanced with senior managers governing the IT investments.

3. Arrangement 3 is much more centralized, with business monarchies making all decisions except business application needs (which is federal). More centralized approaches are typically used in firms with single business units or where profitability or cost control is a predominant issue. Arrangement 3 requires business leaders who are interested and well-informed about IT issues—often the result of CIOs educating and working closely with the senior management team. Arrangement 3 is also sensible when major changes are occurring

(e.g., mergers, major cost cutting, crises etc.) and decision rights must be tightly held.

Figure 6 illustrates how, in the three top-performing patterns, the five decision-making approaches fit together to create a total governance design that is reinforcing and balances the tensions inherent in large enterprises. For example, an IT monarchy for IT architecture can be very effective if the architecture is guided by IT principles set by a business monarchy or a duopoly. The IT decision makers focus on creating an integrated and flexible IT architecture guided by the business-driven IT principles set by the senior leaders in the business monarchy.

## How Top Financial Performers Govern IT

For an enterprise to lead on one specific performance metric (asset utilization, profit, or growth) requires its focus and culture to single-mindedly pursue that goal. Firms that lead their industries in one of these metrics govern IT differently from the leaders on other metrics. They also govern differently from the most

common governance patterns shown in Figure 4.[19] And they govern differently from the top *governance*-performing enterprises (just described and shown in Figure 6), which aim for more balanced performance goals. These patterns for top *financial* performers are generalizations based on a combination of statistical and case analysis and thus are intended as indicative, not definitive.

## Leaders on Asset Utilization

Leaders in asset utilization typically use IT duopoly governance for all five IT decisions. In the duopoly model, the IT group plays an important coordinating role because it is one of the few groups that interacts with all business units and can thus see firm-wide opportunities for sharing and reuse across business units, business processes, and regions.

Firms wanting to lead on asset utilization can learn from these top performers and consider:

- Setting IT principles with a strong flavor of asset utilization and using an IT duopoly consisting of CxOs and the IT group.

- Empowering business/IT relationship managers who focus on achieving business value from IT in their business unit and leveraging the enterprise-wide infrastructure. In firms like DuPont, Campbell Soup Company, and Marriott, business unit CIOs play the role of relationship manager.

- Establishing a technical core of infrastructure and architecture providers who plan and implement the enterprise's technology platform and interact with the business/IT relationship managers.

- Involving IT architects on business unit projects to facilitate IT education of the business leaders and effective use of the shared infrastructure and architecture standards.

- Developing a simple chargeback system and a regular review process to help business unit leaders see the value of shared services.

## Leaders on Profit

Enterprises leading on profit tend to have a more centralized IT governance approach. But that approach requires IT-savvy business leaders (e.g. business monarchies) making the IT decisions on principles, architecture, and investments. In these firms, the *business* architecture—that links key business processes internally and to business partners externally—drives the high-level *IT* architecture, which is strictly enforced. Leaders in profit make effective use of senior business management committees (involving the CIO) to achieve cost control and standardization.

For architecture, standardization occurs through business decision making, with the IT group providing advice, IT education, and research. Business-driven standardization limits costly exceptions to standards but does not eliminate the importance of having an exception process to enable learning.

For infrastructure, leaders on profits used either business or IT monarchies, enabling the enterprise to specify centrally what IT can be shared.

Profit leaders use the federal archetype for business application needs. The federal archetype ensures consistency across the operational units via firm-wide strategies while recognizing differences among the business units. But the federal archetype requires a supportive incentive scheme for managers.

Firms wanting to lead on profitability can learn from top performers and consider:

- Staffing an enterprise-wide IT steering committee with capable business executives and the CIO, to set IT principles with a strong flavor of cost control.

- Carefully managing the firm's IT and business architectures to drive out business costs.

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[19] The descriptions of governance archetypes for the top financial performers is based on statistically significant correlations between three-year industry-adjusted average financial performance and governance archetypes for each IT decision considered separately in 117 stock exchange listed firms in the study. The descriptions represent generalizations of how top performers govern IT. The bulleted points in the text that describe the characteristics of firms leading on the three performance metrics were derived from a combination of statistical analysis of their use of mechanisms and case study analysis. To generate the governance archetype patterns for the top financial performers, a number of assumptions were made. As a result, the patterns of top performers should be viewed as indicative only and not definitive evidence. Some of the assumptions include: 1. To compare across industries, we calculated relative firm performance by subtracting the three-year industry-average performance from the firm's three-year average performance. We divided the result by the three-year industry-average performance, being careful to take into account industries with negative three-year averages. Like all approaches to industry adjustment, this analysis is not perfect but gives a good indication of industry-adjusted performance. The average annual percent change over the three years in each measure was also used in our analysis but not industry adjusted because the percent change is more readily compared from industry to industry. 2. In three instances, the probabilities of significance for the correlations were slightly weaker than the usually accepted level for exploratory work, but they were consistent with the overall patterns for the performance metric and were supported by the case study analysis. 3. We claim no causality between governance pattern and financial performance, but we interpret the patterns as meaningful indicators. 4. There are many other factors that influence the financial performance other than IT governance that we did not consider.

- Designing a clear architecture exception process to minimize costly exceptions and enable learning.

- Creating a centralized IT organization designed to manage infrastructure, architecture, and shared services.

- Using linked IT investment and business needs processes that both make transparent and that balance the needs of the center and the operational units. UPS, for example, uses a project charter process in which the teams managing its four key business processes initiate IT investment proposals. The senior management team then approves projects based on strategic, firm-wide priorities.

- Implementing simple chargeback and service level agreement mechanisms to clearly allocate IT expenses.

### Leaders on Growth

Leaders in revenue growth have governance structures that strive to balance the dominant entrepreneurial needs of the operational units with the firm-wide business objectives. A business monarchy typically defines the IT principles, attempting to balance operational unit and firm-wide goals. These principles focus on growth and empower the operational units to be innovative and not too concerned about standardization—that can come later.

IT investments are typically governed by either feudal or a business monarchy. In high-growth firms, the operational units typically drive growth by maintaining close contact with customers, anticipating and responding to their needs. The operational units often want and need feudal control over their IT investments to implement fast and to experiment with new products and services. Where more firm-wide synergies are desired (e.g., single point of customer contact across multiple business units or shared resources), business monarchies would be used for IT investment.

Interestingly, there was no dominant governance approach for IT infrastructure strategies or architecture for high-growth enterprises. The key to fast growth is customer responsiveness, which often requires local infrastructures. Maintaining IT architectures in high-growth firms is challenging. Many high-growth firms report having a number of IT architectures rather than just one—perhaps equal to the number of operational units! Corporate CIOs in high-growth firms rely heavily on personal relationships and one-on-one influence with business and business-unit IT leaders.

In high-growth firms, business monarchies typically attempt to coordinate by identifying high-level business application needs. Demand for IT outstrips available IT resources, so the business leaders must specify the key business processes to receive IT resources that will distinguish the enterprise from its competitors.

Firms wanting to lead on growth can learn from top performers and consider:

- Empowering the business units to drive IT investment—often achieved by setting IT principles with a strong flavor of innovation and market responsiveness.

- Placing IT professionals into operational units to focus on meeting the unit's internal and external customers' needs.

- Creating substantial operational-unit-based IT infrastructure capabilities tailored to local needs and linked into an often less-substantial enterprise-wide infrastructure.

- Enabling a technical core of infrastructure providers to identify critical integration requirements. They should be skilled at creating synergies and integrating *after* systems are operational because the goal generally is to sacrifice integration for functionality and speed.

## DESIGNING AND ASSESSING IT GOVERNANCE

To analyze IT governance, we suggest that managers map their enterprise's current IT governance onto a matrix similar to Figure 5. Then we suggest that they subjectively assess whether or not IT governance is encouraging desirable behaviors for the enterprise's performance goals. If not, we recommend they use the appropriate top performers' governance (top *governance* performer or top *financial* performer) as starting-point templates to create a new governance model that is then tailored to the enterprise's culture, structure, strategy, and goals. Managers can use a diagram like Figure 5 to engage and communicate the IT governance with other enterprise leaders. Finally, in assessing or implementing governance, managers should consider the following eight critical success factors.

### Eight IT Governance Critical Success Factors

By combining our statistical analysis of the practices of top performers with the case studies, we identified the following eight factors as critical to effective IT governance:

1. **Transparency**: Make each IT governance mechanism transparent to all managers. The more IT decisions are made covertly and off-governance, the less confidence people will have in the structure and the less willing they will be to play by the rules, which are designed to increase enterprise-wide performance.

2. **Actively designed**: Many enterprises have created uncoordinated IT governance mechanisms. These mechanism "silos" result from governance-by-default—introducing mechanisms one at a time to address a particular need (e.g., architecture problems or over-spending or duplication). Patching problems as they arise is a defensive tactic that limits opportunities for strategic impact from IT. Instead, managers should design IT governance around the enterprise's objectives and performance goals, creating a coherent design that can be widely communicated.

3. **Infrequently redesigned**: Rethinking the entire IT governance design is a major undertaking, so it should be done infrequently and only when desirable behaviors change. Designing and implementing a new governance structure takes six or more months, and even more time for the organization to accept it and learn its use. A major change in strategy or a merger typically requires changing business governance because new desirable behaviors are sought. But changes in the economy or adjustments to strategy should not require a governance redesign. Only the types of decisions made within the existing governance arrangements need to be adjusted. For example, if an economic downturn results in an enterprise changing its governance arrangements, that change indicates that the governance structure was poorly designed in the first place, and needs attention.

4. **Education about IT governance**: Education to help managers understand and use IT governance mechanisms is critical. Educated users of governance mechanisms are more likely to be accountable for the decisions they make and less likely to second-guess other decisions. They will not find themselves in the situation described at a major process manufacturing firm: "We have to re-justify our refresh strategy every year. That discussion should have been a 10-minute pitch, but we were in the room for 45 minutes . . . . The management committee turned into a team of volunteer architects trying to redesign cheaper desktops." Education requires senior IT management investments, generally in time. "As a CIO, I invest a lot of my time in making governance work at all levels, to educate, coach, mentor, and lobby," says Andre Spatz, UNICEF's CIO.

5. **Simplicity**: Effective governance arrangements are simple and attempt to reach a small number of performance goals. The more goals, the harder IT governance is to design and manage because each new goal often requires new governance mechanisms. And each new goal can lead to different or conflicting desirable behaviors, which leads to confusion. Like business strategy, IT governance requires determining which performance goals, and thus which desirable behaviors, are most important. The most important should be designed into the governance structure. The rest can be left to an exception process.

6. **An exception-handling process**: Successful businesses continuously forge new opportunities, some of which will not be supported by existing IT decisions. To support these opportunities, IT governance must include a clearly stated exception-handling process—to bring the issues out into the open, allow debate, and most importantly, foster organizational learning. Without an exception process, maverick unsanctioned exceptions will continue to occur but with little enterprise-wide learning. UPS, the successful package-delivery and logistics firm, has a clear exception mechanism for its IT architecture and standards. Any exception to the IT architecture must be justified: the business champion and the architect each draft a one-page statement justifying the need for the exception—one from the business point of view, one from the technical viewpoint. If the two cannot agree, the issue is escalated through the IT architecture committee to the CIO, and eventually to the executive committee, if agreement cannot be reached. Through this process, each exception is openly debated on its merits. Provided that the business case is sound, the exception is granted. The exception is then placed on a list of technology initiatives outside the architecture that are continuously reviewed to determine whether any of them should be redeveloped according to UPS's architecture standards. The strength of the UPS approach is that it allows the IT organization to effectively support new business that has unique systems requirements and does not fit neatly within UPS's highly standardized IT environment. Subsequently, if the market opportunity is large enough, the unique system requirements are brought into the core and made compliant with UPS standards and architecture.[20]

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[20] Jeanne Ross provides this description of UPS' exception handling

7. **Governance designed at multiple organizational levels**. In large multi-business-unit enterprises, IT governance is required at several levels. The suggested starting point is enterprise-wide IT governance, driven by a small number of enterprise-wide strategies and goals. Enterprises with different IT needs in divisions, business units, or geographies require a separate but connected layer of IT governance for each entity. Many enterprises have IT governance at the enterprise, division or geography, and business unit levels. The lower levels of governance are influenced by, and sometimes connect to, mechanisms designed for higher levels. Assembling the governance arrangements matrixes for the multiple levels in an enterprise makes explicit the connections, common mechanisms, and pressure points.

8. **Aligned incentives**. There has been so much written about incentive and reward systems in enterprises that we feel the topic is well covered and understood. Despite that level of understanding, a common problem we have encountered in studying IT governance is the misalignment of incentive and reward systems with the behaviors the IT governance arrangements are designed to encourage. The typical concern is, "How can we expect the governance to work when the incentive and reward systems are driving different behaviors?" This mismatch is bigger than an IT governance issue. Nonetheless, IT governance will be less effective when incentives and reward systems are not aligned.

In conclusion, we believe that leading an enterprise is only part of top management's job. It's necessary, but not sufficient, and sometimes does not sufficiently empower the rest of the enterprise. Top executives, including CIOs, need to govern as well. Good governance ensures that the right groups are making the key IT decisions so that those decisions enable the desired goals and behaviors of the enterprise. Good governance makes clear who can make decisions and how they are accountable for the enterprise goals. Good governance empowers the managers in the enterprise to make decisions without seeking additional senior management approval (where allowed by the governance framework). An acid test of good IT governance is whether the CIO can leave the enterprise for a couple of months to perform due diligence on a potential merger and acquisition. While the CIO is away and not leading, will the governance work effectively or does it require the CIO's leadership to function?

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process. For a description of how UPS uses IT, see Ross, Jeanne, "United Parcel Service: Delivering Packages and E-Commerce Solutions," MIT Sloan School of Management, Center for Information Systems Research Working Paper No. 318, 2001.