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- Research Article:** a completed research article drawing on one or more CISR research projects that presents management frameworks, findings and recommendations.
- Research Summary:** a summary of a research project with preliminary findings.
- Research Briefings:** a collection of short executive summaries of key findings from research projects.
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- Business Models and IT Investments
- Governing IT for Different Performance Goals
- Assessing Architecture
- Infrastructure as Variable Cost
- Managing IT Related Risks

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- Assessing the Performance of Alternative Business Models
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ALIGNING IT ARCHITECTURE WITH ORGANIZATIONAL REALITIES¹

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Firms have at least two different—and often competing—architectures. The *IT architecture* supports the standardization and integration requirements of firms' key business processes and technology platform. The *organizational architecture* establishes decision-making structures and individual accountabilities. From an IT architecture perspective process integration and standardization initiatives create efficiencies, predictability and customer responsiveness—all good things. But from an organizational architecture perspective, integration and standardization come at a cost—often colliding with decision-making and accountability structures.

Although we often think of integration and standardization as two sides of the same coin, they impose different IT and organizational demands. Standardization develops commonalities across organizational units. Integration develops linkages between organizational units. To help firms distinguish their integration and standardization requirements, we have developed a simple two-dimensional model with four quadrants, each specifying a different kind of organizational synergy (See Figure 1). We have found that different firms, and even different organizational levels within one firm, can position themselves in one of these quadrants to increase the value and limit the risks associated with moving to more agile architectures. In this briefing we explain the benefits and risks of each quadrant of this 2x2 model.

Affiliate synergy (low standardization/low integration). Typical of large enterprises with relatively independent business units, affiliate synergies apply to enterprises that need little standardization and in-

tegration within and across organizational units. DuPont, Carlson Companies and Partners Healthcare fit this model at the corporate level. The organization architecture suited to affiliate synergy consists of autonomous business units with few mandated processes and little shared data. The IT architecture emphasizes business unit independence in application solutions. However, shared infrastructure has become increasingly important to firms in this quadrant because it offers big efficiencies without sacrificing much organizational autonomy.

Firms in this quadrant sometimes yearn for a “one face to the customer” capability, but the preference for an organizational architecture that prizes business unit independence conflicts with the requirements of IT architectures that support integration or standardization. So firms in this quadrant necessarily rely on a narrowly targeted subset of standardized data, and often some technical wizardry, to enable senior management to manage global customer relationships. For example, DuPont has implemented SAP Financials globally and a large financial services firm is building a data warehouse from transaction data across its business units.

Amalgamate synergy (low standardization, high integration). Amalgamate synergies result from integration of related activities between organizational units while minimizing standardization across units. For example, Toyota Motor Europe is a new holding company designed to coordinate the activities of Toyota's European marketing, R&D and manufacturing divisions. The three functional operating units are consolidating the European functional activities. Toyota wants to protect each unit's autonomy to help them achieve functional excellence, but still coordinate intersecting activities. Toyota Europe can accomplish this integration with a small set of data and communication standards to support integration at the divisions' touch points.

Similarly, one diversified financial services firm developed experts focused on the distinctive requirements of products such as brokerage, personal banking, commercial banking, insurance and lending. These experts could provide world-class service in their individual areas, but they could not support customer demands for an integrated statement or

¹ This research was made possible by the support of CISR sponsors and in particular, CISR patron Microsoft.

staff a single toll free number. This firm has not tried to standardize the activities of the sales people across the product lines because many of its products require unique expertise. However, the firm is building a single customer repository, implementing a customer relationship management system and expanding the responsibilities of call center staffs to address customer demands for more integrated services.

Firms in this quadrant rely on one or more shared data resources to facilitate integration across units. To create that data and an underlying shared infrastructure, amalgamate synergies rely on consensus processes. Without process standardization, data standards are always at risk. However, senior management usually mandates the existence of standards while enlisting business units to design them. For example, Pfizer establishes technology standards through an architecture committee with representatives from each of its functional business units. That committee reports to the senior technology management team who mandated the standards. Consensus approaches tend to be slow, but firms in this quadrant avoid the risk associated with process standardization.

Franchise synergy (high standardization, low integration). Firms like McDonald's have little need for integration but they benefit from standardized processes across organizational units. Franchise synergy is appropriate for firms that are, in fact, organized around franchises, such as hotel chains, as well as for firms that grant autonomy to business units within a tightly controlled process environment. For example, ING Direct (a division of the Dutch financial services firm, ING), which offers branchless banking in seven countries, has adopted a franchise synergy model. Each country office operates independently but leverages a subset of the same standardized IT-enabled financial services (savings accounts, mortgages, mutual funds, life insurance). This model gives ING Direct an identifiable business brand without the expense of cross-country integration. By sacrificing the potential benefits of process integration (e.g., global access to customer accounts), the firm gains needed efficiencies for its low-cost business model.

Firms in this quadrant build highly standardized IT architectures—infrastructure, data and applications—for use across business units. However, senior management must negotiate with relatively independent managers for adoption of most standards. For example, one hotel chain noted that IT offered shared infrastructure services, but IT managers had to “sell” individual proprietors on the value of the

service. This tended to limit funding for new infrastructure services. ING Direct also permits its wholly-owned banks to decide which of its standardized modules they want to implement. By creating standardization without integration between business units, franchise synergy limits opportunities for business units to learn from one another in representing the firm to the customer. This has proved to be a tough tradeoff—particularly when firms believe that ultimately, integration will provide a competitive advantage. But the standardization creates significant efficiencies in operations without the expense of securing consensus among the business units.

Core process synergy (high standardization, high integration). When organizational units are tightly integrated around a standardized set of processes, firms generate core process synergies. UPS, for example, has standardized its package delivery process across its regions and integrated the full set of activities from pick-up to delivery. BIC Graphic Europe (a division of BIC Corporation) which manufactures and supplies promotional products such as pens and lighters, has standardized and integrated its order-to-cash process across country units. Delta Air Lines has integrated its standardized operations and related customer experience processes through a publish and subscribe environment that populates and accesses nine shared databases. MeadWestvaco has standardized and integrated its supply chain through an ERP implementation. Core process architectures demand easy, real-time access to the data that drive the core activities. To capture and maintain this data, the organization adopts standardized processes. Thus, the aligned IT architecture for a core process architecture is highly centralized with data isolated from applications.

Core process synergies demand highly centralized management environments. Infrastructure services, data, and applications all feel senior management's stamp. The potential benefits of core process synergies are significant, but many firms have stumbled trying to introduce the rigid data and process standardization required for core process synergy. The risk of this business model is that the benefits are not apparent to—or the processes are not understood by—those who must implement the standards. In this case, the firm can incur the significant costs associated with building an environment for standardization and integration without generating any benefits.

Applying the IT-Organizational Architecture Framework

Because most firms need both standardization and integration, many are trying to move aggressively

toward the upper right hand quadrant in the framework. But core process synergies assume that senior management can centralize and standardize much organizational decision-making. This organizational architecture does not work for every enterprise. Some firms start by generating the benefits from one of the other quadrants, moving to core process synergies gradually; others have multiple organizational levels, each operating in a different quadrant. For example, Johnson & Johnson (J&J) seeks affiliate synergies at the enterprise level. These synergies result from a centralized operations unit providing core infrastructure services, and from corporate-wide network, desktop and communications standards. To address the integrated needs of common customers, J&J introduced sector organizations. The pharma sector, for example, is developing a common customer relationship management system to provide an integrated view of pharma customers. Finally, umbrella companies, such as specialized marketing and R&D companies, embody standardized, integrated architectures to provide core services to multiple J&J companies. J&J's different organizational levels are unarguably complex, but they allow J&J to extract its standardization from its integration require-

ments and thus introduce organizational change more incrementally.

We recommend that every firm identify the most appropriate quadrant in the IT-Organizational Architecture Framework. Any of the four quadrants may provide the optimal integration and standardization, depending on the organization's business model. Comparing the existing IT and organizational architectures with the representative characteristics of that quadrant will help management determine how well the firm (or other organizational level) is positioned to generate the benefits of the selected quadrant. A key point of the framework is that standardization and integration offer different benefits—and different costs. Firms that need the efficiencies of standardized processes can achieve franchise synergies without pursuing the responsiveness—and expense—of business unit integration. Similarly, firms requiring business unit integration may be able to avoid the pain of standardization if amalgamate synergies can meet their needs. We believe firms can optimize the value of their enterprise architecture by choosing a quadrant that offers immediate value and minimizes costs.

Integration	High	<p><i>Amalgamate Synergy</i></p> <ul style="list-style-type: none"> • Semi-autonomous specialized organizational units • Independent IT application decisions • Mandated shared databases developed by consensus • Shared infrastructure services designed by consensus 	<p><i>Core Process Architecture</i></p> <ul style="list-style-type: none"> • Centralized environment with functional/process/business unit matrices • Centralized IT application decisions • Senior management mandated databases • Centralized, standardized infrastructure services
	Low	<p><i>Affiliate Synergy</i></p> <ul style="list-style-type: none"> • Autonomous organizational units • Independent IT application decisions • Few data standards mandated hierarchically • Core infrastructure services sometimes optional 	<p><i>Franchise Synergy</i></p> <ul style="list-style-type: none"> • Independent business units in a controlled environment • Centralized IT application decisions, with choice in implementation • Highly standardized data through negotiated hierarchy • Shared infrastructure services with negotiated purchase
			High
			Standardization

Figure 1:
The IT—Organizational Architecture Framework

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CORE INCOMPETENCIES¹

Jeffrey L. Sampler, *Associate Professor of Information Management and Strategy, London Business School & Visiting Scholar, MIT Sloan Center for Information Systems Research*

Over the last decade, we have witnessed a fundamental shift in how firms think about strategy—many have jumped on the core competencies bandwagon. Every day you read about some firm justifying their M&A divestiture or acquisition through the logic of ridding themselves of “non-core assets” or “acquiring core assets.”

However, in reacting to the financially motivated diversification logic of earlier decades, many companies have taken the mantra of core competencies too far. Over the last few years, we have seen more and more firms entering into outsourcing and alliance relationships as they attempt to streamline their unwieldy firms to be more responsive to turbulent environments. Because of this streamlining, many firms are now focusing on one or two core competencies as their source of competitive advantage.

What happens to companies that have narrowly defined themselves around a single core competence, when the world no longer values that core competence? Moreover, what happens when this devaluation occurs quickly? Increasingly, this is the power of information technology (IT), causing the competitive landscape to morph, enabling new business possibilities. Understanding these pressures of near constant reinvention and its impact on potentially devaluing core competencies is the

¹ For more information, please see “Core Incompetencies” by Jeffrey Sampler, MIT Sloan CISR Working Paper No. 333, November 2002.

next decade’s fundamental management challenge.

Decay of Core Competencies

Examining many of the traditional examples of core competencies (Honda—motors, Canon—optics, Sony—miniaturization, etc.), the advantage is from one of two arenas—expertise or information. Expertise is consistent with the recent focus on knowledge management and intellectual capital as a source of competitive advantage. Information as a key resource has long been understood in financial markets, but is now being valued in other industries.

Unfortunately, IT facilitates the decay of both these assets more quickly than firms anticipate. In Figure 1, we explore the impact of IT on these two fundamental types of core competencies—expertise and information. We are interested in how quickly technology decays the value of these assets—their half-life. With the erosion of these core competencies, the competitive advantage of a firm also erodes. Understanding the nature of the decay of these competencies is key to understanding the nature of competitive dynamics for a firm.

Protected Species: Core competencies in these industries don’t erode quickly. A firm does not have to act quickly for their information to have competitive value. At first glance, there are many firms with these characteristics. Heavy industries or low-tech industries, such as cement, paper mills, oil, utilities and agriculture are likely candidates. However, upon close examination of the dynamics of these industries it is clear that IT is increasingly driving the nature of competition.

For example, technological advances are slashing the costs of finding, producing and refining oil, creating a new economic calculus for the industry. The new alchemy runs from 3-D seismology to exotic wells that sit on the

ocean floor. The progress already achieved is mind-boggling. The average cost per barrel of finding and producing oil has dropped about 60% in real terms over the last 10 years, while proven resources are about 60% higher than in 1985 charts.

Most supposedly low-tech industries have moved out of this quadrant. The few examples of enterprises left in this quadrant are protected in some way—monopolies or regulations retard or prevent technological innovation from penetrating these businesses.

Erosion of Existing Business Model: Companies in this quadrant are characterized by relatively little shift in the fundamental skills needed to compete in the industry, but must react quickly to information to have any competitive advantage. Fashion, financial services and media are good candidates for this quadrant.

Today, anytime there is a major fashion show anywhere in the world, people take photographs of the new collections and post them on the Internet. Knock-off fashion houses look at the photographs in near real-time and get their copycat fashions in the stores before the designers do. Zara, a Spanish fashion chain, understands this compressed fashion cycle. Zara introduces new fashions to their stores every 15 days, reducing and the need for end of season sales.

Firms in this cell are facing major challenges to renew themselves. The power of IT to send information around the world in near real-time (particularly globally connected public infrastructures such as the Internet) for increasingly smaller costs fundamentally destroys one of the major methods by which firms competed and distinguished themselves.

Strategic Partnerships: The value of expertise of companies in this cell is eroding and ceasing to provide an advantage. At the same time, these firms do not have to react to information quickly in order for it to be strategically important. Industries facing such situations include pharmaceuticals, the photographic film industry and consulting.

If we look at the paradigms of science behind medicine, we see that 20 years ago drug discovery was based on principles of chemistry. With the biotechnology revolution, principles of drug discovery were then based on biology. Finally, in today's research, such as the Genome Project, we see that scientists are now trying to fight diseases at the molecular level, e.g. correcting the DNA sequence. In such an environment, one of the key skills required is the ability to store and manipulate billions of bits of information—drug discovery is now based on information. Most major pharmaceuticals conducting research in this area have formed major alliances with a data mining and/or data warehousing company, because this is now one of the critical skills required in this industry's competitive environment.

Strategic alliances are one method of taking advantage of the strengths (brand, installed customer base) of existing companies and the technology of new firms entering these competitive arenas. Alliances have their risks, but are often the best compromise among the choices of building the resources yourself (which would take too long) and outright acquisitions of these new companies (in case you pick the wrong company or the wrong technology to back).

Constant Reinvention: In this hyper competitive cell, firms face the challenge of skills or competencies eroding quickly as well as quickly reacting to new information in order to survive. The entire IT industry—including hardware, software and telecommunications lives in these fast changing market conditions. For example, in 1995, Packard Bell was the largest retail PC seller in the US because it pioneered the sale of low-cost PCs to consumers (mainly through discount store chains). Unfortunately, because it did not reinvent itself quickly enough as other manufacturers began to aggressively sell directly to consumers with a build-to-order market via the Internet (such as Dell), Packard Bell fell victim to the price competition that it had initiated. Competitors moved faster down the dual curves of eroding skills and information value.

At the same time, the half-life of information decreased as product cycles and time between shifts in customer preferences compressed. Indeed, even NEC and Groupe Bull taking stakes in 1996 and over the next three years investing at least \$2 billion in Packard Bell (Financial Times, Nov 4, 1999, “NEC and Bull pull Packard Bell out of US Market,” p. 37) was not enough to reverse the competitive trends in place. Packard Bell has now withdrawn from the US market. From leader to loser in four years—that is the pace of competition here. Increasingly, this is the nature of competition for almost all high-tech companies.

In summary, technology is causing firms to react to information more quickly and technology is eroding the value of knowledge more quickly. In other words, no matter what type of business you are in, the impact of technology on your industry will drive you to the upper right quadrant of the table—constant reinvention of your business model. Firms now face two key questions: 1) What is the change process of moving from my current business model to one of constant reinvention? 2) How do I think about strategy in a world of constant reinvention? The answer is through core incompetencies.

The Rise of Core Incompetencies

In today’s technologically rich business environment the duration of competitive advant-

age is the duration of a technology life cycle. Why? Because new technologies fundamentally enable new business models. Each generation of technology often makes things possible that were not possible or previously affordable. New generations of technology are constantly shifting the efficient frontiers of business. If your firm is not reinventing itself at the pace of technological innovation, it is potentially losing ground.

The implications of technology-enabled models of competition are profound, but there is possibly a deeper and more immediate impact of the role of digital technology in business—fundamentally altering how we think about competitive advantage. When the half-lives of both information and expertise reduce together, the strategic impacts are huge. In this non-linear competitive arena, it is insufficient to rely only on a narrowly defined set of core competencies that are relevant for today’s competitive arena. Firms must now also focus on those skills that may be relevant in the future evolution of the industry. We will refer to these as *core incompetencies*, i.e. those skills that an organization believes to be critical to future competitive advantage, but that it currently does not possess. Although, this is not a simple transition to make it is the essence of strategy-making in the future.

Expertise Half-Life	Short	Strategic Partnerships	Constant Reinvention
	Long	Protected Species	Erosion of Existing Business Models
		Long	Short
		Information Half-Life	

Figure 1: IT Induced Change

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MANAGING THE IT PORTFOLIO (UPDATE CIRCA 2003)¹

Peter Weill, *Director*

Sinan Aral, *PhD Candidate*

MIT Sloan Center for Information Systems Research

Why Use Portfolios for IT

Just as investors address their multiple objectives using portfolios of financial investments, firms have portfolios of information technology (IT) investments. Four different management objectives guide firms' investment in IT. Each objective results in a different IT asset class with a unique risk-return profile. Just like any other investment portfolio, the IT portfolio must be balanced to achieve alignment with the business strategy and the desired combination of short and long term pay off. This briefing describes the management of IT investment as a portfolio and presents new benchmarks of IT portfolios. The familiar management tool of a financial portfolio provides a powerful commercial lens through which to manage IT investments.

Four Management Objectives Leading to Four IT Asset Classes

Our research found that business leaders have four different management objectives for investing in IT:

- **Transactional**—cut costs or increase throughput for the same cost (e.g., a trade processing system for a brokerage firm);
- **Informational**—provide information for any purpose including to account, manage, control, report, communicate, collaborate or analyze (e.g., a sales reporting and analysis system);

¹ This CISR briefing is the first of two on IT portfolios in 2002. The next briefing "IT Portfolios and Firm Performance" will be completed later this year. This research draws on and extends the material on IT portfolios in *Leveraging the New Infrastructure: How market leaders capitalize on IT* by Peter Weill and Marianne Broadbent, Harvard Business School Press, 1998 with a CISR study of 147 firms in 2002. This research was made possible by the support of CISR sponsors, in particular, CISR patron Microsoft and the National Science Foundation, grant number IIS-0085725.

- **Strategic**—gain competitive advantage or position in the market place (e.g., ATMs were initially very successful in increasing market share for the innovating banks);
- **Infrastructure**—provides the foundation of shared IT services used by multiple applications (e.g. servers, networks, laptops, customer databases). Depending on the service, infrastructure investments are made with the objective of either reducing IT costs via consolidation providing a flexible base for future business initiatives. Infrastructure investments often must be made in anticipation of future business needs.

Investments in the four management objectives become an IT portfolio with four asset classes (see Figure 1). Infrastructure is the base of the portfolio providing IT capability to support the applications above. The average firm allocates 54% of its total IT investment each year to infrastructure.² Transactional systems utilize the IT infrastructure and account for 13% of average IT investment. The marginal cost to implement a particular transactional system such as a web services based travel ordering and processing system will depend on the capability of the installed infrastructure. If the web services exist in the infrastructure, the project cost will be much smaller than if the web services have to be implemented first. The informational systems typically summarize the transactional systems and provide communication or collaboration facilities, often including data from outside the firm (e.g., industry trends or competitor sales). The informational systems sit on top of, and use both the transactional and infrastructure systems, accounting for 20% of average IT investment. Similarly, strategic systems use both the transactional and infrastructure systems and account for 13% of total average IT investment. Interestingly since 1994, through many fluctuations in

²Based on a study of 147 firms in 2001/2. The total IT investment includes all centralized and decentralized IT spend (expenses and depreciated capital) both insourced and outsourced plus all people dedicated to IT services and management. The percentage of the total IT investment allocated to infrastructure dropped from 57% in 1994–7 to 54% in 2001 probably due to a combination of the availability of more cost effective infrastructure and less duplication within firms as they provide more shared IT infrastructure services.

economic conditions, the percentage of IT portfolio that firms allocate to this high risk, high return asset class hasn't changed (see Figure 2). In 2003, firms still see the same potential to gain competitive advantage from IT enabled initiatives as they have at any time over the last 10 years. The four asset classes (as we will discuss in detail in the next briefing) have different risk/return profiles with risk and potential returns increasing from transactional (reliable/modest returns) to informational to infrastructure to strategic (high risk/high potential returns).

Any particular project or system can span more than one management objective depending on the combination of its strategic goals and the installed IT base. For example, senior managers of a large software firm investing in a CRM system to better understand their customer segments identified the breakdown as 60% informational, 25% transactional, 5% strategic and 10% infrastructure. Another firm implemented exactly the same CRM product but had different management objectives and needed more new infrastructure. This resulted in a completely different categorization with 20% informational, 10% transactional, 40% strategic and 30% infrastructure. The second firm operated in an industry where CRM was new and thus a potential competitive advantage. Therefore, exactly the same technology can have different management objectives in different firms—the portfolio approach thus adds a firm's business perspective to its IT investments.

Systems also change over time. ATMs were a very successful strategic IT initiative in 1984. After competitors emulated the offerings, ATM investments became transactional, reducing processing costs relative to a bank branch (circa 1994). Today ATMs have evolved into infrastructures with some banks specializing in providing the network and charging fees for use by competitors and their customers. Thus a firm's asset class percentages in their IT portfolio today will be different from the portfolio five years ago, even if they contain the same systems.

Using Portfolios to Manage IT Investments

Typically IT portfolios are used by senior management teams, IT investment committees and IT budgeting processes to analyze the business' proposed IT investment. The dollars for each IT project are allocated by percentages into the four asset classes and consolidated in a single portfolio for the business unit or firm. Senior management analyzes the portfolios, assessing fit with strategy and risk profile. Opportunities for sharing and reuse are also identified.

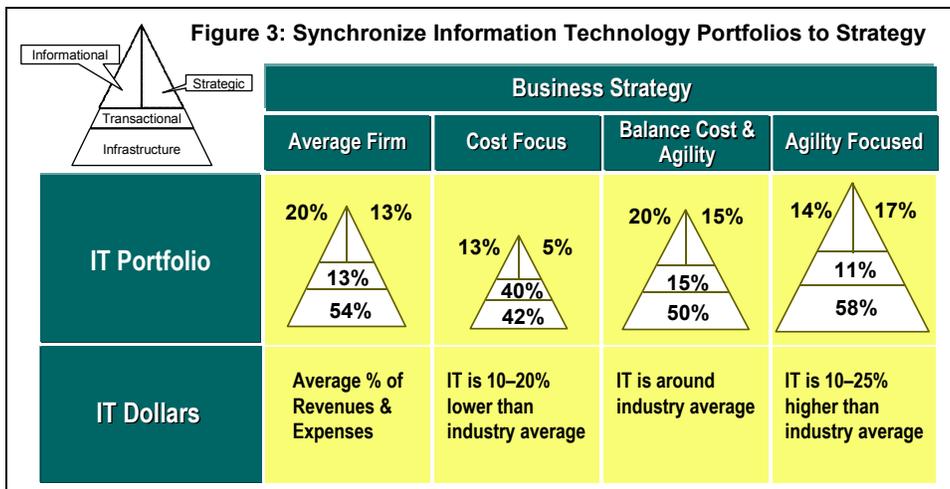
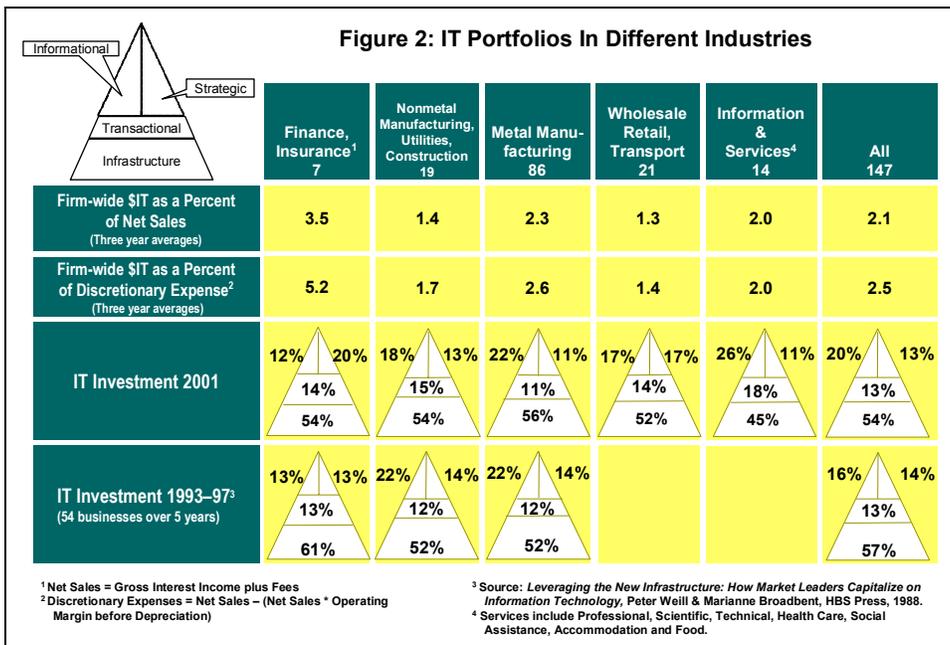
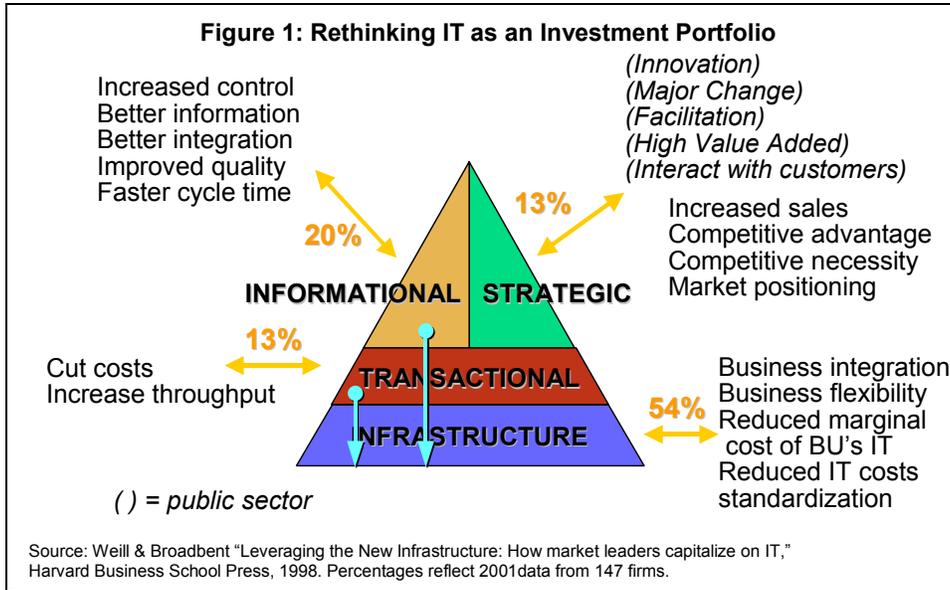
Typical portfolios vary by industry and strategic objective. Figure 2 shows the average portfolios by industry

with details on portfolio size and asset class mix. Figure 3 provides benchmarks by broad based strategic objectives. To use portfolios, we suggest a firm classify its planned IT investment into the four asset classes and then analyze its relative position. Questionnaires are available from CISR to classify a business' IT investment. For example, an insurance firm plans to invest 3% of gross revenues in IT in 2003 with a portfolio of 40% infrastructure, 40% transactional, 15% informational and 5% strategic. Compare this portfolio to the average financial portfolio in Figure 2 and ask the following question: *Can you explain the difference between your portfolio and the industry average by your strategy?* If the insurance firm has a low cost strategy competing on price then this IT portfolio looks well aligned. The insurance firm spends less than the industry average on IT, is under-weight (i.e. under investing) in infrastructure (with a long-term payoff) and over-weight in transactional (with a short term low risk payoff) that is a good fit with its low cost strategy. Their informational investment is in line with industry average but is focused on systems to control costs and they invest little in the higher risk strategic asset class. However, if the insurance firm's strategy is focused on innovation and fast time-to-market with new products and services, their IT portfolio allocation would be concerning.

A number of firms have adopted and adapted the portfolio approach to their needs and internal language including banks, manufacturers and brokerage firms, all with the objective of engaging the business leaders in IT investment decisions. For example, Dan Garrow, the CIO of Mohegan Sun, a Connecticut-based casino, implemented IT portfolios. Dan reflects on the experience

"The concept of managing our work based on a portfolio approach intrigued us. Comparing our strategy against our plans for expenditures in each of the four management objectives for investments, we realized there was a disconnect between our long-range plans and our resource allocations, both human and financial. Portfolio thinking helped us bring the day-to-day activities back into alignment with our long range objectives."

In these tough economic times many firms are re-weighting their IT portfolios towards more predictable, cost-saving-oriented, transactional systems. Other firms are looking to infrastructure consolidation and outsourcing to reduce IT costs leaving more of the budget for new informational and strategic applications. Portfolio approaches provide a business-oriented lens through which to make and debate IT investment decisions.



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INFORMATION—AT LAST¹

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For the past two decades, corporate IS resources have been devoted to improving key “bread and butter,” transaction-oriented, business processes. The focus has been on enterprise resource planning (ERP), customer relationship management (CRM) and internet-based logistics. By contrast, in far too many companies, one major area of great importance to management—effectively providing useful information to employees, at all levels—has received far less attention.

It is true that there are decision support systems, executive information systems, balanced scorecards and knowledge management capabilities in many organizations. Intranets make more information than ever before accessible by employees. However, intranets are often scattered throughout the organization in every function and division. Information, today, in almost all companies exists as “islands.” There is no conceptual design. The result is that, for most employees, the information they need to do their jobs is not there.

In 2003, this neglect is in the early stages of being rectified. My discussions with executives in more than twenty companies strongly indicate major changes under way. Furthermore, a recent CISR study notes that the percentage of total IT resources devoted to information has increased from 16% to 20% from 1994–7 to 2001 in the average firm.² Information, rather than being a stepchild of transaction processing, is becoming a key focus of new system development in many organizations. Here are some examples:

- Dean Athenasia, EVP Strategic Marketing of Fleet Bank’s Wholesale division, led the charge to build a “more integrated, sales-driven bank”

¹ This research was made possible by the support of CISR sponsors, and in particular CISR Patron Accenture.

² *Managing the IT Portfolio* (Update Circa 2003), P. Weill & S. Aral. MIT Sloan CISR Research Briefing, Vol. III, No. 1C, March 2003.

from the 26 product organizations that were the legacy of several acquisitions by Fleet. Based initially on a customer warehouse, Fleet’s “Business Advisor” packaged portal from Siebel provides the newly established community of 3,000 sales people with not only customer information but also access to all of the applications, such as account planning and on-line pricing, that they need to carry out day-to-day business (Figure 1).

- Lifespan’s hospitals provide two communities with portal access to the data they need. Physicians have access to a data mart that contains all information about services (lab, x-ray, etc.) rendered to their patients. The financial community has access to a package centered on a data mart containing financial, demographic and other information about each patient. Included in the financial software are a number of applications that enable financial personnel to analyze results by department, physician, geography, service and other variables.
- At the start of 2003, Selective Insurance’s one data mart serves the claims function. Access is through the Selective intranet. With major transaction processing systems well underway or nearing completion, Selective is now turning its attention to the provision of information to other functions in the organization. While acknowledging the expense, CEO Greg Murphy believes that access to information is critical for the success of the organization that ranks among the top 50 insurance companies. Four new data marts are planned for agency managers, underwriting, actuarial and financial personnel.

An Information Architecture?

There is an emerging pattern in the way information is stored and made available to executives and other employees forming the basis for an “information architecture.” In most IT organizations today, there are several “architectures” including data, telecommunications, computer capability and, often, applications. Yet, there is often no design or architecture for information. The conceptual design emerging from our work has four components. First, it includes *data warehouses*, or data marts, that draw

data from transaction processing systems as well as other sources and *store* the information. Second are the typically web-based *portals* that provide *access* to the information. Third, are *communities* of the *users* of the information. Finally, there are *applications* that *enable effective use of the information*. While simple, this model is powerful in providing visibility into the management of information in several organizations. Let us take a brief look at each component:

Data warehouses or marts. Only data with information value is included in these storehouses. Data warehouses have been with us in either relational or multi-dimensional form for the past 20 years. However, their use is rapidly increasing. For example, in the past three years, Sherwin Williams' manufacturing division has created sales, vendor and key customer data marts. Given their success, more are planned.

Portals. For many companies, intranets serve as the portal to information and services for their employees. However, the use of portal packages from companies like Plumtree, Epicentric and Siebel is growing rapidly. Companies such as Procter & Gamble, GM, GE, Eli Lilly and Ford are leading in the implementation of these packages that provide infrastructure (e.g., single sign-on), information access and application capability. The newest portal packages are aimed at eliminating the "islands of information." Some include, within their application structure, formerly independent systems such as executive information systems, scorecards and knowledge management capabilities.

Communities. Communities have always been important but are now increasingly recognized as a critical aspect of a learning organization. Communities are typically *informal*, self-organized groups of people with common interests and, thus, a desire to communicate, see and often store common information. There are also many *formal* communities in organizations. These are groups, like functional departments or project teams, who have a common need for information from above (directions), from below (status data) and from other parts of the organization (e.g., marketing plans for the manufacturing function).

Applications. These are the programs available to the users to work the information in ways that are useful to them. Some aid in decision-making, others just in the thought process. All enable community members to carry out their work more efficiently than before.

It is the combination of these four integrated components tailored around the firm's strategic goals that create value in the examples we have studied. Interestingly, in each of the cases above, the communities were a formal entity recognized on its organization chart. Thus, we suggest the most important information in an organization should flow to, and through, its functional, project, etc., organizations.

There are a number of companies today installing one or two of these components and each, individually, can provide benefit. However, the tailored combination of all four is critical. Lifespan's physicians save significant time and energy with this quartet of capabilities. Fleet's sales organization has come together in a way that would be impossible without Business Advisor and its data warehouse. There is a logical synergy of these four components. It is the equivalent of synergy found in the transaction processing area in ERPs.

Developing a tailored combination of these components is expensive and time-consuming. There were three "critical success factors" and none are surprising. The first is executive understanding and backing. Jay Sarles at Fleet, Greg Murphy at Selective and George Vecchione at Lifespan all provided leadership. The second is effective project management and the last is effective management of change.

Why the Emphasis on Information Today?

We see five reasons for the increasing emphasis on information. Perhaps most important is the growing recognition of the need to effectively support knowledge workers. Drucker points out that knowledge workers are "the chief source of capital in our knowledge-based society." A second factor is the expected shortage of qualified employees. As the current "baby boom echo" nears its end, organizations recognize the need to attract top candidates. Effective information support is a major draw empowering top performers. Third, there is a growing understanding of what IT can contribute by senior executives who increasingly are asking for information to manage. Finally, software technology to support employees, especially knowledge workers, is rapidly improving. Portal package and data warehouse technology and the understanding of how to use these tools are all rapidly increasing in sophistication.

Despite these incentives, and particularly in tough economic times, the move to a more complete information architecture – and its implementation in

organizations - will be gradual. These informational investments require both nerve and understanding to invest, since many are not well suited to a traditional ROI calculation. Movement toward portal-based access for all communities, formal and informal, in an organization is a long way off. However, the leaders in this area focus on the critical communities where management understanding and organizational need come together. Fleet tied together not only islands of information, but also disparate organization pieces. Selective and Lifespan

have worked toward smaller data marts but provide single-point-of-interaction for more communities. The community-portal-data warehouse model can be extended, eventually to an entire organization in which multiple communities will be served with shared access to warehouses subject to permissions. If what we see in these companies is correct, the process of pulling together the “islands of information” into a more effective design is underway.

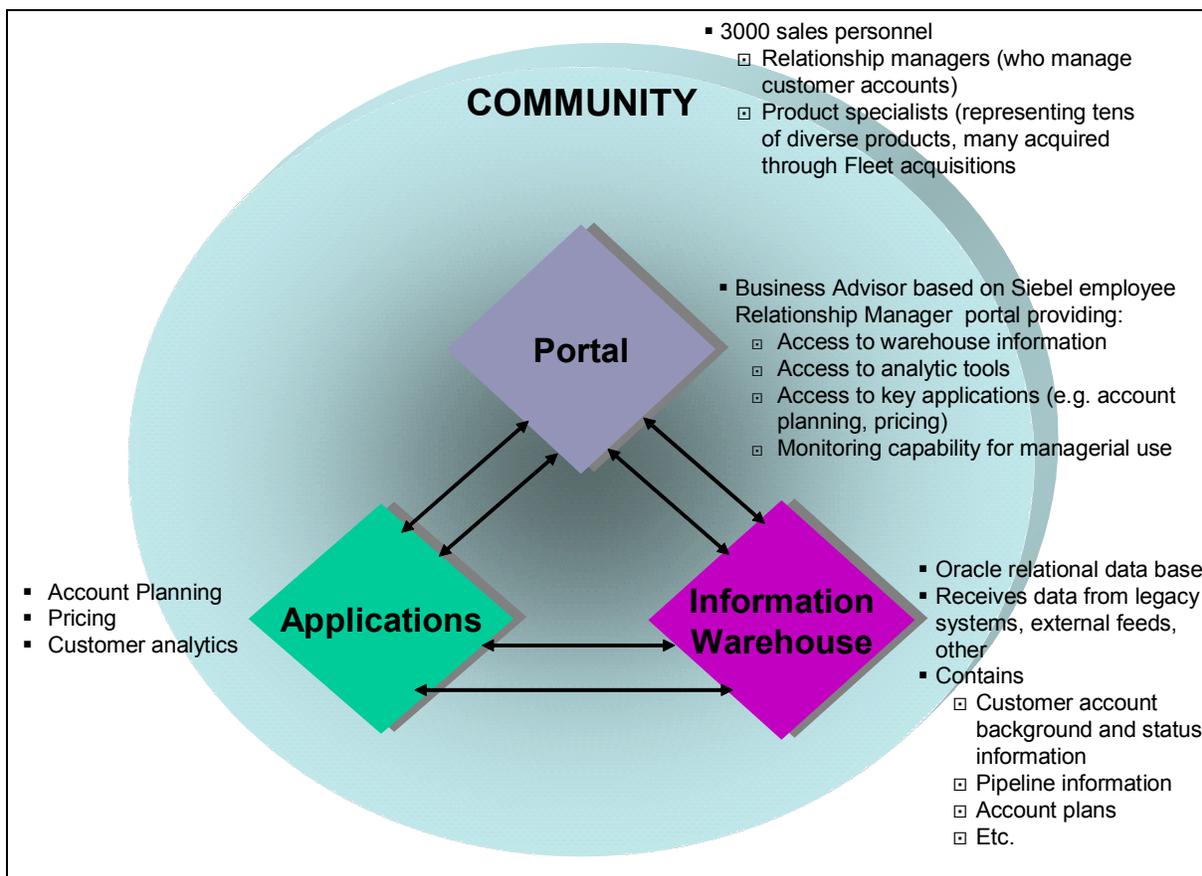


Figure 1: Fleet Bank Components

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WHO MAKES BETTER IT DECISIONS— BUSINESS OR IT MANAGERS?¹

Peter Weill, *Director & Senior Research Scientist*
Chris Foglia, *Center Manager*
 MIT Center for Information Systems Research

In an earlier briefing we argued that business managers should take more responsibility for IT decisions.² After completing additional research exploring this issue, we present some thought provoking results. We wanted to understand if the trend of broader involvement in the IT decision-making process pays off. By studying IT decision rights (i.e., IT governance) and performance in a large number of enterprises we can now add some evidence to the debate. The short answer is that in top performing enterprises, business managers and IT professionals make business oriented IT decisions jointly.

CIOs from 256 enterprises in 23 countries told us about their IT decision-making processes and performance. The 256 enterprises represent ten industries including manufacturing, government, financial services, professional services and telecommunications. The average enterprise had eight business units, invested 8% of their total annual expenses in IT and had 800 IT professionals.

We studied who made and who had input into five key IT-related decisions (three business-oriented and two IT-oriented); see the table at right for decision definitions.

Decision makers were separated into three categories:

- 1. Business:** Officer level executives, business unit leaders or their delegates, individual business process owners
- 2. IT:** Individuals or groups of IT professionals

¹ This research was made possible by the support of CISR sponsors, and in particular CISR Patron Gartner and their EXP Program.

² See Ross, J. and Weill, P., "Six Decisions Your IT People Shouldn't Make," CISR Research Briefing, Volume II, No. 3A, October 2002.

BUSINESS DECISIONS	
IT Principles	High-level statements about how IT is used in the business
Business Application Needs	Specifying the business need for purchased or internally developed IT applications
IT Investment & Prioritization	Decisions about how much and where to invest in IT including project approval and justification techniques
IT DECISIONS	
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)
IT Architecture	An integrated set of technical choices to guide the enterprise in satisfying business needs. The architecture is a set of policies and rules that govern the use of IT and plot a migration path to the way business will be done (includes data, technology, and applications).

3. Joint: IT and business executives making decisions together

The percentages in Figure 1 (totaling 100) show the proportion of IT decisions that were made by each type of decision maker. For example, 29% of IT decisions were business oriented and made by business managers. Technology oriented IT decisions made by IT professionals accounted for 27% of decisions. Almost a quarter of the IT decisions were business oriented and made jointly by business and IT leadership while 8% were technical IT decisions made jointly. We also measured IT governance performance³ and all the relationships in the next section are statically significantly correlated with governance performance. IT governance performance was also positively statistically correlated to several three-year average measures of firm performance (e.g., ROE) giving us a lot of confidence in the governance performance measure.

³ These relationships were determined by statistically significant correlations between the enterprise's IT decision making patterns and a four factor measure of IT governance performance including: cost effective use of IT, use of IT for growth, use of IT for asset utilization, use of IT for business flexibility.

Who performed better?

Enterprises using joint decision-making for the three business-oriented IT decisions have superior performance. The combination of business and IT insight together is more effective on average than either business or IT people making these business-oriented IT decisions alone. The poorer performing firms had business people making the business oriented IT decisions alone. Even though joint decision-making can take longer, we learned it is the dialogue, debate, constructive disagreement, mutual education and probably even frustration that occurs during joint decision making that improves performance.

For the more technical IT decisions of infrastructure and architecture, no particular type of decision-making (business managers, IT professionals or joint) was generally superior. The best decision making arrangements depended on the enterprise's strategy, culture, processes and many other factors.

How Are These Decisions Made?

We found 12 commonly used mechanisms for IT decision making. The mechanisms are ranked by effectiveness and use in Figure 2. Some of these mechanisms were used only for business managers making decisions (e.g., executive committees) and others typically involved only IT professionals (e.g., architecture committees). Other mechanisms were specifically designed for joint decision-making (e.g., process teams with IT leadership) or to facilitate a rich business and IT dialogue (e.g., business/IT relationship managers). Figure 2 presents the percentages of the 256 enterprises using each mechanism in the purple column. The effectiveness of each mechanism as judged by the CIO is represented as the purple horizontal bars. For example, business/IT relationship managers and process teams with IT members were the most effective mechanisms while chargeback was the least effective overall.

How to make joint decisions

Figure 2 also presents (in the blue shading) the use and effectiveness of mechanisms by the 37 enterprises that used joint decision making for all three business oriented IT decisions.

The biggest differences in mechanism use between the joint decision making firms and all the firms were in seven of the twelve mechanisms. Joint decision makers used five mechanisms more frequently (marked with a green circle on Figure 2)

and either more effectively or about equally effectively than all the firms. Joint decision makers used two often-troublesome mechanisms less frequently (marked with a red square on Figure 2) — IT councils and capital approval committees.

For example, 92% of these joint decision making firms used business/IT relationship managers to enable joint decision making, ranking this mechanism highest on effectiveness. These business/IT relationship managers hold a variety of titles, such as account managers, business technology managers, business relationship managers or business analysts. In firms like DuPont, Campbell Soup and Marriott, business unit CIOs play the role of relationship manager. The organizational status of business unit CIOs empowers them to make and facilitate decisions binding both business units and the enterprise.

The business/IT relationship manager often reports to the CIO with a dotted line to the business unit head (or visa versa) and has primary responsibility for managing the relationship to create maximum value from IT. The business/IT relationship managers facilitate joint decision making for the three business-oriented IT decisions. These managers need to be true hybrids—equally comfortable discussing business issues, such as effective market segmentation, as with finding the best design of a distributed database to collect the customer segment information. The business/IT relationship manager serves a second critical enterprise-wide function for decision making around the two technical IT decisions: reuse and sharing opportunities become apparent when the same IT specialists (e.g., in infrastructure or architecture) work with the different business/IT relationship managers. The specialist can identify common trends across the enterprise's opportunities for sharing.

We suggest enterprises review their IT decision making in these five key decisions, asking the following questions⁴:

1. Who has decisions rights for the five key decisions?
2. What mechanisms are used for these decisions?
3. How well are these mechanisms performing?
4. Are we using joint decision-making for the three business-oriented IT decisions?

⁴ For more information on IT governance, please see: a.) Weill, P. & Woodham, R., "Effective IT Governance," CISR Research Briefing, Volume I, No. 2B, 09/01; b.) Weill, P. & Broadbent, M., "Describing & Assessing IT Governance: The Governance Arrangements Matrix," CISR Research Briefing, Volume II, No. 3E, 10/02; and c.) Weill P. & Ross J. "IT Governance: How Top Performers Manage IT Decision Rights for Superior Results" Harvard Business School Press, forthcoming.

Figure 1

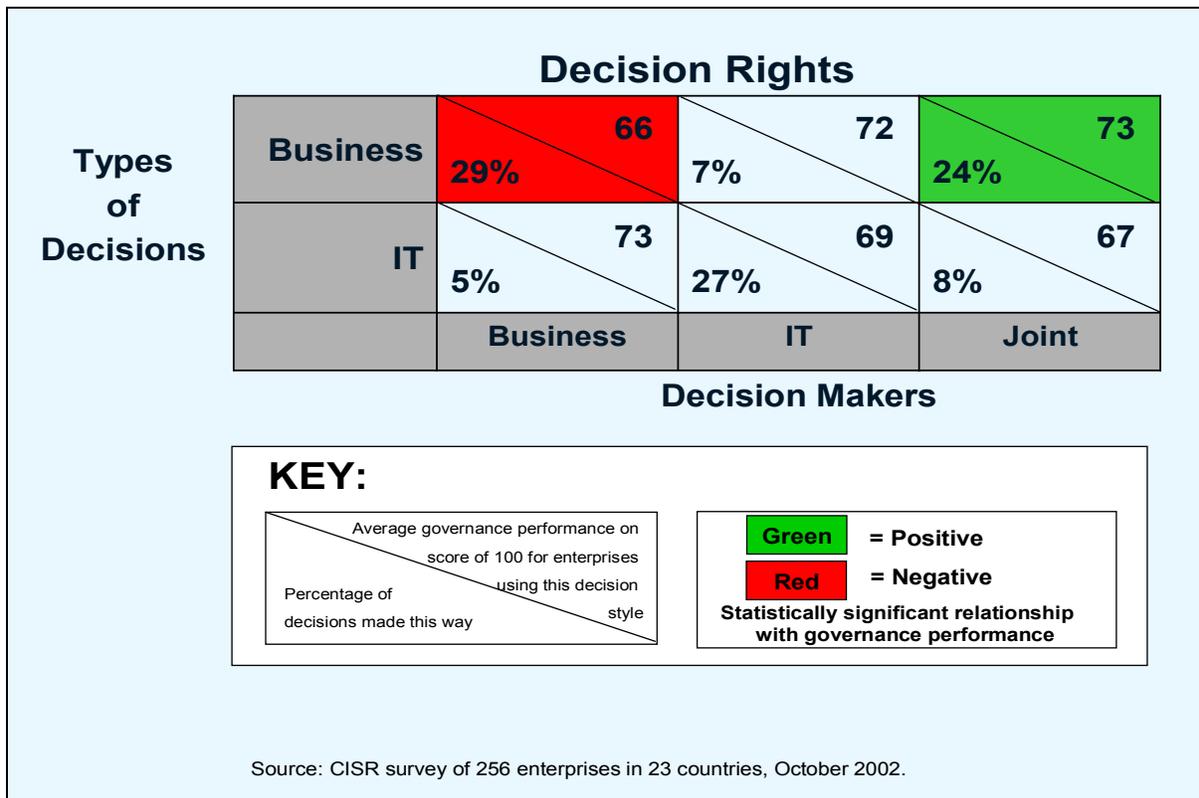
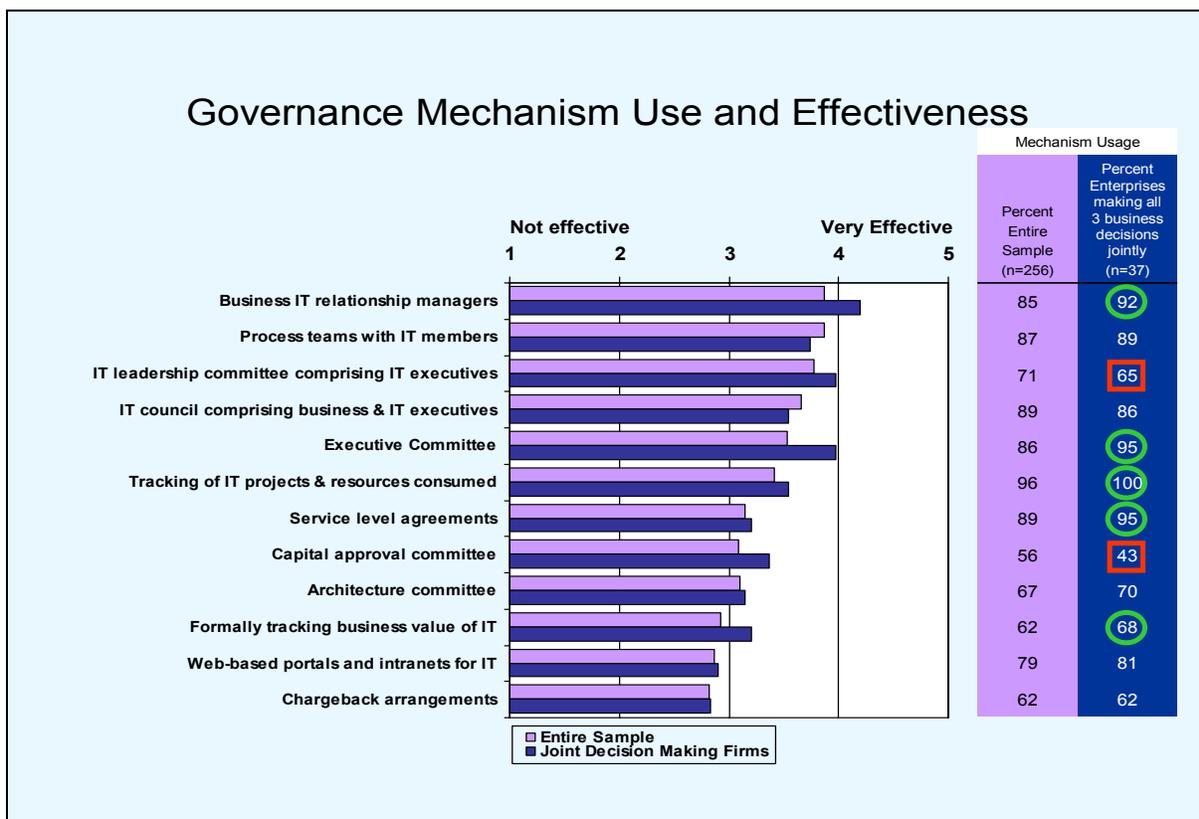


Figure 2



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LEVERAGING THE INCUMBENT'S ADVANTAGE IN TECHNOLOGY-ENABLED BUSINESS INITIATIVES¹

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Center for Information Systems Research

One of the most important decisions in responding to a technological or strategic innovation is choosing how to organize the new venture. Organizational structure creates a set of expectations and communication patterns that pervade the whole company and have important implications for the way that innovators can effectively build and scale the new business.

Many people suggest that, when adopting an innovation, new ventures can best succeed when isolated from the rest of the firm. Separating the new venture from the old gives it the focus to move quickly and adapt rapidly. Unfortunately, separation can make it difficult for the new to benefit from the old. As a result, separated innovators often end up playing the startups' game, on the startups' field, with the startups' rules.

When launching online pharmacies, industry-leading retailers Walgreens and CVS used different approaches. CVS achieved an early lead with a highly-separated "spin-out," while Walgreens' integrated approach was slower to launch a full-service online drugstore. But, when CVS decided to reintegrate its online and offline units in order to increase online profitability, it had great difficulty. Online and offline had become too different over time. In the transition, CVS.com lost its top managers and many of its staff and, along with them, a great deal of institutional knowledge. It needed to integrate physical and IT infrastructures, as well as staffs who didn't know each other well. Online performance dropped significantly, and took months before it began to turn around.

Walgreens, with its integrated organizational approach, was able to tightly integrate databases,

infrastructure, and processes. Some processes, such as getting prescription history or ordering refills, were actually easier online than offline. As a result, while initially slow to ramp up, Walgreens' online performance grew steadily and soon surpassed CVS.

The influence of entry timing

Separated and integrated approaches have different advantages and risks depending on the time at which an incumbent decides to act. Early in the life cycle, there's a great deal of uncertainty, and thus a premium on speed and learning—being able to try new versions of a product or service to match the changes in the market. Later in the life cycle, there is less value in being able to do major changes quickly. Customers have a good feel for what they want, and providers have converged on a similar set of features in their products or services. The basis of competition shifts to efficiency and quality. As a result, separated models, which favor agility, tend to give way to more efficient integrated models over time.

In a sample of 31 e-business spinouts, zero survived as independent entities by 2002. Fully 77% were reintegrated and the rest were shut down. One reason for reintegration was to enable tighter synergies between online and offline. Another was to find more efficient ways of operating.² Whether shutting down or reintegrating, the transitions were costly in terms of both money and management attention.

Our research found that there are three viable approaches to organizing for an innovation. The remainder of this briefing describes the three approaches and then presents a framework for deciding which approach is most appropriate for the next innovation.

1.) *Integrated Leader*: Entering early with an integrated approach has early risk, but long-term potential. Unless managed appropriately, integrated ventures often slow down or even fail due to

¹ Much of this briefing is adapted from Iansiti, McFarlan, and Westerman: "Leveraging the Incumbent's Advantage," *Sloan Management Review*, Summer 2003, pp. 58–64.

² Comparing calendar year 2000 financial performance of fifteen e-businesses run by incumbent retailers, we found that the most separated initiatives were three times less productive in terms of online sales per employee and online sales per marketing dollar than their more integrated competitors.

conflicts between the new and the old. But, they tend to outperform separated approaches over time because they can creatively leverage the firm's powerful existing assets.

Walgreens' integrated approach used a dedicated online team in headquarters, staffed with a mix of experienced Walgreens employees and new hires. Online liberally used infrastructure and people from throughout the corporation. The initiative, while reporting to a General Manager, received regular attention and issue resolution in monthly meetings of the firm's senior management team. Online made full use of Walgreens' offline capabilities such as mail service pharmacy facilities, in-store pharmacies, merchandise distribution centers, prescription history systems, and corporate brand. Because Walgreens actively managed internal relationships, offline managers soon changed their opinions from "What's online going to do to me now?" to "Can online do this to help me?" Pharmacists even began collecting e-mail information at the pharmacy counters of its stores. Walgreens' integrated approach has delivered strong and steady growth in online (and total firm) performance.

2.) *Separated-then-Integrated*: Entering separated and then integrating later can blend early agility with later efficiency. But, it requires the right architecture for processes and systems, and the right set of rules for the new organization *from the beginning*. While separate innovators should be encouraged to be agile, they should also be encouraged to make use of existing assets and relationships wherever possible. Managers should continuously consider how the old can help the new (and vice versa). Managers in the new should resist varying from methods, infrastructure and business rules of the old without very good reasons. Otherwise, the new group becomes ever-more-different from the old, making integration tougher and tougher.

Like CVS, Charles Schwab used a highly separate group to launch its e-business. However, unlike CVS, the new group was led by a respected manager from the existing organization, and many of its staff came from the old. Online employees had numerous formal and informal linkages to the existing organization. In addition, e-Schwab employees used a simple rule: deviate from existing systems and procedures only where absolutely necessary. As a result, when Schwab decided to integrate e-Schwab, it was able to do so very quickly and with little rework. CVS, on the other hand, had a much more difficult time reintegrating CVS.com, and online performance suffered for months.

3.) *Integrated Follower*: Entering later in the life cycle with an integrated approach enables the innovation to take shape so that executives can build a strong business case. This integrated follower approach is also an opportunity to change the old business in order to position the firm for the future. But, it requires strong, consistent attention from the most senior levels of the firm, and an incentive structure that permits managers to commit to growing both the old and the new.

Online trading was highly disruptive to Merrill Lynch's retail business model. Merrill's managers and financial advisors resisted the innovation and the company was slow to adopt it. As a result, Merrill endured jeers from analysts, while fast-moving Schwab gained an advantage in attracting new customer assets. However, once Chairman David Komansky decided to act, Merrill moved quickly and powerfully. The whole company was aligned toward the change and resistance was not tolerated.

The Integrated Follower approach enabled Merrill to meet the challenge of online competitors and revamp a commission-based compensation scheme that had been troublesome for years. Merrill challenged Schwab's pricing by allowing customers to have access to research capabilities while trading online. It also launched a service in which customers could mix online and broker-assisted trading for a fixed annual fee. Merrill soon reversed the drain in new customer assets and its financial performance improved markedly.

Choosing an approach for the next business initiative

Choosing the right approach involves two sets of factors (Figure 1). The organization's will to help the innovation succeed depends, in large part, on the extent to which the innovation will make life more difficult in the existing business. People who think the innovation will reduce their own profits, or who don't want to change to help an unrelated person, may resist the innovation or slow it down. This can hurt the existing business as well as the new one, and is a major reason why Schwab and CVS chose separated approaches to e-business. The organizational difficulties can be overcome, as in the cases of Walgreens and Merrill, by leadership that shows the value of the innovation to the business, and incentives that reward integrative behavior.

The second set of factors, importance of being an early leader, is a complex decision. Acting too

slowly can prevent a firm from being able to compete effectively. But, the firm that acts too quickly can spend millions before customer demand reaches viable levels. For book sellers, whose customers could switch providers easily, there was value in moving early. But, as many e-businesses found, early commitments soon led to problems as the technologies and business models they chose became obsolete. Firms that used proven tools and business models, or who waited for them to stabilize, were able to manage e-business more effectively.

As Figure 2 shows, these two dimensions help determine what approach is right for each situation. If the organization has the will to help the innovation succeed, then the Integrated Leader approach can be very successful, as in Walgreens' case. If not, then the firm should use either the Separated-Integrated

or Integrated-Follower approach, as Schwab and Merrill did.

Importantly, regardless of whether the initiative starts integrated or separated, all three viable approaches are characterized by integration later in the life cycle. When considering a long-term separated venture, one can ask the following question: *If the innovation can't leverage your existing assets, why are you considering it?* Managers using a separated-then-integrated strategy should be careful, from the beginning, to ensure that innovators will be able to integrate with the existing organization. This integration is truly the incumbent's advantage: linking the people, processes, infrastructures, and resources of the new and old to create powerful synergies that competitors cannot match.

Figure 1: Factors to consider in choosing an approach

Organizational will for the innovation	Importance of being an early leader
<p>Detract from willingness:</p> <ul style="list-style-type: none"> ▪ Negative effect on profitability of existing business lines ▪ Assets being leveraged need to change for the innovation <p>Promote willingness:</p> <ul style="list-style-type: none"> ▪ Incentives based on company-wide (versus business-unit-level) performance ▪ Vocal and consistent senior management support for the innovation ▪ Insiders in important roles 	<p>Move faster:</p> <ul style="list-style-type: none"> ▪ Easy price/performance comparisons (likelihood that customers will switch providers) ▪ Value of economies of scale or learning for the innovation <p>Move slower:</p> <ul style="list-style-type: none"> ▪ Locked-in customers ▪ Viability of the innovation unclear ▪ Extreme variety and rate of change in key tools and business models for the innovation

Figure 2: Choosing an approach that's right for each situation

Organizational Will	HIGH	Integrated Follower or Integrated Leader³	Integrated Leader
	LOW	Integrated Follower	Separated-Integrated
		LOW	HIGH
		Importance of being an early leader	

³ Although speed may not be important in this quadrant, firms with the organizational will to act may choose the Integrated Leader path, since it allows them to develop the innovation incrementally and learn from each step, rather than doing it all at once as the Integrated Follower approach does.

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EVOLVING COMPETENCIES FOR IT OUTSOURCING¹

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Despite its checkered history, IT outsourcing is gaining steam. Constant demands for cost-cutting result in greater enthusiasm for vendor-imposed standardization and efficiencies. Enthusiasm for standards and efficiencies, however, has not diminished concerns that IT outsourcing can negatively impact strategic business processes. Against this backdrop vendors are developing technologies and business models offering broader and more flexible IT outsourcing services. How can firms gain efficiencies through outsourcing without sacrificing competitiveness? How can firms take advantage of new vendor services?

While some firms adopt outsourcing out of frustration with IT costs or perceived lack of value of the internal IT organization, other firms outsource to enhance their competitiveness. These firms adopt vendor standards for some or all of their IT infrastructure services to gain efficiencies where distinctiveness adds no value. They perceive their ability to leverage outsourcing as a competitive advantage. For example, Mobil Travel Services, which provides road trip planning services, recently initiated Mobil Companion, a subscription service allowing customers to plan trips online. With a limited start-up budget, the company decided to focus its resources on developing the content and electronic interfaces important to its traveling customers. Instead of investing in internal infrastructure the company outsourced all core infrastructure services, including system computing, storage, memory and network connectivity.

Because Mobil Companion was a narrowly focused, start-up operation, management was able to

distinguish between foundation IT services and strategic applications. Established firms typically have more complex, sometimes conflicting, business objectives. Moreover, their IT infrastructure services are intertwined with strategic applications, confounding the task of delineating commodity IT services.

Traditionally firms have adopted one of two approaches to overcome the challenges of outsourcing and generate business value: (1) monolithic or (2) best of breed. These two approaches emphasize different management competencies for generating value from outsourcing. In this briefing we describe the critical competency associated with generating value from each outsourcing approach and discuss how these competencies position firms to take advantage of evolving outsourcing models. (See Figure 1.)

Relationship Management Competency for Monolithic Outsourcing

Firms that rely on one or a small set of vendors for a broad set of IT services establish strategic partnerships with their vendors. Australia's largest bank, Commonwealth Bank of Australia (CBA), for example, has achieved 20% annual savings in both its telecommunications and IT operations through large outsourcing contracts with Telecom New Zealand and EDS Australia respectively. CBA purchased an equity interest in its major vendors to help align objectives. Even more critical to countering risks, however, is CBA's development of a *relationship management* competency.

A relationship management competency is the ability to continuously work with a strategic partner in a manner that leverages the partner's expertise to achieve cost savings and facilitate flexibility in responding to market changes. At CBA the vendors commit to providing infrastructure services that address business needs cost effectively. CBA commits to providing clear business direction. To align these distinct responsibilities CBA created the role of relationship managers. CBA found that

¹ This briefing reports on a research project in progress exploring how sourcing strategies will affect business value and strategic agility. This research was made possible by the support of CISR sponsors, and in particular CISR Patron IBM.

assigning high-level IT managers to this role helped business units articulate business needs, maximize value and minimize the cost of IT to their units. CBA's relationship management competency also involves including vendors in IT governance arrangements. The vendors sit on two committees (the IT Architecture Group and the IT Systems and Service Delivery Group) responsible for resolving the inevitable clashes between IT standards and business flexibility. The committees make IT decisions in light of business priorities—both cost containment and new business capabilities.

Mechanisms like relationship managers and joint business-IT governance can enhance IT effectiveness in any firm. By emphasizing the vendors' role in these mechanisms CBA's outsourcing model emphasizes that effective relationship management treats vendors as an extension of the firm's IT unit.

Services Integration Competence in Best of Breed Outsourcing

Firms believing IT infrastructure cannot be outsourced in a monolithic arrangement often selectively outsource services to take advantage of vendor expertise and efficiencies. These firms rely on a *services integration* competency to generate value from their outsourcing relationships. A services integration competency is the ability to define, integrate and leverage the standard components of multiple providers. A critical success factor associated with services integration is the ability to partition services in a meaningful way—usually consistent with vendor offerings—so that the firm can benchmark vendor performance and apply a stable set of metrics to simplify vendor management.

For example, Carlson Companies, whose brands include Regent International and Radisson hotels, T.G.I. Friday's restaurants, and Gold Points Reward (a consumer loyalty program), has been building a more robust infrastructure to support its diverse business units. An important step in that process was the development of an IT services catalog, which defined the services that business units received from central IT. Carlson created a Shared Services organization to define the IT and financial services available to business units, and to establish service levels and prices. In creating the shared services catalog the IT unit explored market offerings and benchmarked its prices against market prices. Carlson has the option to outsource services that

vendors can offer more cost effectively, allowing a "plug and play" approach to infrastructure services.

Standard services with well-defined metrics are an important part of any outsourcing arrangement. Carlson's experience highlights how carefully designed standard IT services and metrics can enable firms to integrate best of breed internal and external IT services.

Relationship management and services integration enable outsourcing benefits, but they are costly to pursue. Effective relationship management requires involving vendors in management and governance mechanisms that have proved difficult to master even with only internal staff. Contractual provisions in monolithic outsourcing arrangements may foster involvement, but management has limited control over vendor representatives. Services integration allows best of breed outsourcing but incurs search and integration costs to identify what's "best."

Future Trends in Outsourcing

Utility outsourcing models, offering core IT infrastructure services on a pay-as-you-use model will increase the potential benefits of outsourcing. Mobil Travel Services adopted this model and was able to ramp up quickly as it rolled out its new business. The utility arrangement also allows Mobil Travel Services to maintain costs consistent with revenues as it experiences predictable fluctuations in demand over the course of a year. This utility computing has become possible because IT infrastructure services have become increasingly standardized. The introduction of utility computing should provide even greater clarity and standardization around core infrastructure services. This clarity should reduce the costs associated with both relationship management and services integration. By reducing these costs, utility computing enhances the outsourcing value proposition and thus should increase the incidence of IT infrastructure outsourcing.

We anticipate that, as more firms outsource infrastructure, strategic value will shift toward applying their relationship management and services integration competencies to business process outsourcing. Business process outsourcing is calling upon the same outsourcing models—and the same management competencies—as IT infrastructure outsourcing models. For example, BAE Systems outsourced its entire human resource function to a

single vendor, Xchanging.² BAE has a Board of Directors comprised of both Xchanging executives and BAE HR Executives which meets quarterly to ensure operational control. Two other governance bodies, one focused on HR and the other focused on IT, draw their membership from both BAE and Xchanging and ensure alignment between the two strategic partners.

In contrast, Hong Kong based Li & Fung designs an outsourced manufacturing process for each of its clients calling upon the different services of over 7500 vendors to meet the customized needs of retail clothing stores.³ Li & Fung relies on a set of

standardized metrics to monitor cost and quality sharing these metrics with its providers in order to continuously improve quality and costs.

In summary, similar to the experience of other utilities, utility computing will simplify IT operations and reduce costs so that IT infrastructure services offer fewer opportunities for competitive advantage. However, in applying their outsourcing experiences to business process outsourcing, the relationship management and services integration competencies firms have developed will become more important to business success. Firms need to carefully develop the competencies required for the type of outsourcing they choose because it is that competency not the outsourcing which is the ultimate source of competitive advantage.

² See Lacity, M., Feeny, D. and L. Willcocks, "Transforming a Back Office Function: Lessons from BAE Systems Experience with an Enterprise Partnership," *MISQ Executive*, June 2003.

³ See Magretta, J. "Fast, Global, and Entrepreneurial: Supply-Chain Management, Hong Kong Style," *Harvard Business Review*, September/October 1998.

Figure 1: Comparison of Outsourcing Strategies

	Monolithic Outsourcing	Best of Breed Outsourcing
Nature of vendor relationships	Strategic partnership (buy full services from close partner)	Transaction (buy standard services from best provider)
Key management competency	Managing strategic relationships	Services integration
Critical success factor(s)	Governing IT with strategic partners	<ul style="list-style-type: none"> Defining standard service components and metrics for assessing them Integrating service components into end-to-end services
Key risks	Misaligned objectives; poorly designed contractual agreement	Search and integration processes can be costly

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HOW TOP PERFORMERS GOVERN IT¹

Peter Weill, *Director & Senior Research Scientist*
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Good IT governance apparently pays off as firms with better than average IT governance have at least 20% higher return on assets than other firms with the same strategic objectives. In addition, top performing firms govern IT differently from the typical firm and from each other depending on the performance metric they lead on. Our research identified the governance patterns of large, complex enterprises leading on specific performance objectives. This briefing describes those patterns and provide insights from top performers for IT governance for each of the five key IT decisions—see Figure 1 for definitions.

To lead an industry on one particular performance metric requires a focus and culture that single mindedly pursues the goal. Firms that lead their industries on asset utilization, profit or growth govern differently.²

Leaders on Asset Utilization

Leading asset utilizers heavily use duopoly governance (see Figure 2). In the duopoly model the IT group plays an important coordinating role as they are one of the few groups who interact with all business units and thus see firm-wide opportunities for sharing and reuse across business units, business processes and regions.

¹ This CISR briefing is the third in a series on IT governance. The first briefing was *Effective IT Governance*, Weill, P. & Woodham, R., MIT CISR Research Briefing Vol. 1, No 2B, September 2001. The second was Weill, P. & Broadbent, M., *Describing & Assessing IT Governance: The Governance Arrangements Matrix*, MIT CISR Research Briefing, Vol. II, No. 3E, October 2002. For more information particularly on the exemplary firms mentioned see Weill, P. & Ross, J., *IT Governance: How Top Performers Manage IT Decision Rights for Superior Results*, Harvard Business School Press, forthcoming. Thanks to Jeanne Ross, Francisco Hoffman, Susie Lee & Chris Foglia for their contributions to this research. This project was made possible by the support of CISR sponsors, and in particular CISR Patron Gartner and their EXP Program.

² This analysis and Figure 2 are 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. The patterns represent generalizations and are only indicative of how top performers govern IT as a number of assumptions were made.

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

- Setting IT principles with a strong flavor of asset utilization via duopoly of the CxOs and the IT group.
- Empowering business/IT relationship managers focused on achieving business value from IT for their business units and leveraging enterprise-wide infrastructure. In firms like DuPont, Campbell Soup, 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 education and effective use of shared infrastructure and architecture standards.
- Developing a simple chargeback system and regular review process to help business unit leaders see the value of shared services.

Leaders on Profit

Firms leading on profit tended to have a more centralized governance approach requiring IT savvy business leaders making IT decisions—particularly high level architecture decisions. In these firms the business architecture—the linking of key business processes internally and with business partners—drives the high level IT architecture that is strictly enforced.

Leaders on profit made effective use of senior business management committees (including the CIO) to achieve cost control and standardization. For architecture, standardization occurs through business decision making with the IT group providing advice, education and research. Business-driven standardization limits costly exceptions to standards but does not eliminate the importance of an exception process to enable learning. Profit leaders successfully use federal arrangements for business application needs nicely balancing with business monarchies for IT principles. The federal arrangements ensure a consistency across the operational units with firm-wide strategies while recognizing the differences between business units. This type of federal arrangement 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 who set IT principles with a strong flavor of cost control.
- Carefully managing the firm's IT and business architecture to drive out business costs.
- Designing clear architecture exception processes 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 balance the needs of the center and the operational units. UPS, for example, uses a project charter process in which the teams managing their four key business processes initiate IT investment proposals. The senior management team then approves projects based on strategic, firm-wide priorities.
- Designing a simple chargeback and service level agreement mechanism to clearly allocate IT expenses.

Leaders on Growth

Leaders on revenue growth have governance structures striving to balance the dominant entrepreneurial needs of the operational units with the firm-wide business objectives. Business monarchies set IT principles to attempt to balance operational unit and firm-wide goals. These principles typically focus on growth and empower the operational units to be innovative and not too concerned about standardization—that can come later.

IT investments are governed by either feudal or business monarchy arrangements. In high growth firms the operational units typically drive the growth by close contact with customers anticipating and responding to needs. The operational units often want and need feudal control over their IT investments to enable fast implementations 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 sharing resources) business monarchies would be used for IT investment.

Interestingly there is no dominant governance approach for IT infrastructure strategies or architecture for high-growth enterprises. The key to fast growth is customer responsiveness that 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 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 IT leaders.

In high growth firms business monarchies typically identify high level business application needs. Demand for IT outstrips available IT resources, so business leaders must choose and specify the key business processes on which to focus 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 focused on meeting their internal and external customers' needs.
- Creating substantial operational unit based IT infrastructure capability tailored to local needs and linked into an often less substantial enterprise-wide infrastructure.
- Enabling a technical core of infrastructure providers who identify critical integration requirements generally sacrificing integration for functionality and speed while skilled at creating synergies and integrating after systems are operational.

A singular focus on one performance goal is often not possible or desirable. For many top performing enterprises we studied such as State Street Corporation, Carlson Companies, Citibank Asia, Scotland Yard, UNICEF and Commonwealth Bank of Australia IT governance is a blend of the above designed to deliver both growth of the operational units and shared services.

Figure 3 presents the top three performing governance arrangements (of the 256 enterprises studied) for a blend of performance objectives and includes both for profit and not for profit enterprises. Arrangement 1 was popular using federal governance for business application needs to capitalize on potential synergies across business units. Arrangement 2 was similar with a duopoly for applications needs and a business monarchy for investment and works well for enterprises with fewer synergies. Arrangement 3 was much more centralized and typically used where profitability or cost control are key. Arrangement 3 is also sensible when major changes are occurring and decision rights must be tightly held (e.g., mergers, major cost cutting, crises etc.). For all successful IT governance, regardless of the arrangements, education of business executives was critical. "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.

Figure 1. Definitions

Five Key IT Decisions		IT Governance Archetypes	
IT Principles	High level statements about how IT is used in the business	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 Architecture	An integrated set of technical choices to guide the organization in satisfying business needs. The architecture is a set of policies and rules that govern the use of IT and plot a migration path to the way business will be done (includes data, technology, and applications)	IT Monarchy	Individuals or groups of IT executives
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)	Feudal	Business unit leaders, key process owners or their delegates
Business Application Needs	Specifying the business need for purchased or internally developed IT applications	Federal	Shared by C level executives and at least one other business group (e.g., CxO and BU leaders) – may also include IT executives. Equivalent of the center and states working together.
IT Investment & Prioritization	Decisions about how much and where to invest in IT including project approvals and justification techniques	IT Duopoly	IT executives and one other group (e.g., CxO or BU leaders)
		Anarchy	Each individual user

Figure 2. How Top Financial Performers Govern

Governance Archetype	Decision Domain				
	IT Principles	IT Architecture	IT Infrastructure Strategies	Business Application Needs	IT Investment
	Decision	Decision	Decision	Decision	Decision
Business Monarchy	Profit Growth	Profit	Profit	Growth	Profit Growth
IT Monarchy			Profit		
Feudal					Growth
Federal				Profit	
Duopoly	ROA	ROA	ROA	ROA	ROA

Profit, ROA, Growth = Firms with statistically significantly higher or increasing average three-year industry adjusted Profits, ROA or Growth

Most common pattern of all firms

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Figure 3. Top Three Governance Performers

Domain Style	IT Principles	IT Architecture	IT Infrastructure	Business Application Needs	IT Investment and Prioritization
Business Monarchy	3	3	3		2 3
IT Monarchy		1 2	2 1		
Feudal					
Federal				1 3	
Duopoly	1 2			2	1
Anarchy					

1 2 3 Top Three Governance 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).

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PLANNING A STRATEGIC OUTSOURCING PROFILE¹

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As firms outsource IT activities they create an outsourcing profile—the set of outsourcing arrangements in which a firm engages. A firm's IT outsourcing profile is influenced by the business strategies that define outsourcing objectives, the firm's IT and organizational competencies, and the capabilities available from vendors. In a prior briefing we noted that different outsourcing arrangements demand different organizational competencies.² In this briefing we review IT outsourcing options in light of firms' IT objectives and vendors' value propositions.

Firms have four choices of *what* to outsource: (1) infrastructure and computer operations encompassing all shared services and local infrastructures; (2) applications development delivering new capabilities; (3) application maintenance and enhancement; and (4) IT-enabled business processes. Firms may choose to partly or wholly outsource one, some or all of these activities. Firms then have two choices of *how* to outsource each activity: (1) large-scale strategic partnerships in which a firm contracts for broadly defined services from a single vendor; and (2) selective, best of breed outsourcing in which a firm contracts for a service component that may—or may not—be customized to its specific needs. Each outsourcing arrangement responds to different organizational objectives and demands different competencies. Figure 1 summarizes firms' IT outsourcing options in a 4x2 matrix.

¹ This research was made possible by the support of CISR sponsors, and in particular CISR Patrons IBM and Microsoft.

² See Ross, J. and Westerman, G., *Evolving Competencies for IT Outsourcing*, CISR Research Briefing Vol. III, No. 2C, July 2003.

The matrix in Figure 1 can be filled in to show the thrust of a firm's existing outsourcing arrangements or to help firms identify primary and secondary targets for their outsourcing efforts. Although a firm's outsourcing profile may include examples of outsourcing arrangements in each of the cells in the matrix, its key IT outsourcing objectives can often be addressed within a single cell or small set of cells. Large-scale partnerships require a great deal of management attention and initially are highly disruptive. Selective outsourcing requires the ability to integrate individual service components. Firms we have studied benefit from limiting their outsourcing to arrangements that have a strong value proposition. A clearly defined outsourcing strategy (i.e., what and how a firm chooses to outsource) requires alignment between a firm's IT objectives, its IT and organizational capabilities and what a vendor has to offer. Examples of three firms' dominant outsourcing arrangements are instructive.

Examples of Outsourcing Arrangements

Outsourcing for Business Transformation

BuildCo, a manufacturing firm, has focused its outsourcing efforts on developing a single strategic partnership, consuming nearly half the firm's IT expense budget and encompassing most infrastructure services and data center operations as well as some application development and maintenance. BuildCo instituted outsourcing to help transform from a set of independent operating units to a global firm with a portfolio of powerful consumer brands. Management viewed the role of IT in its transformation as providing shared technology platforms and data to facilitate both common enterprise-wide business processes and unique business applications. The objectives of the outsourcing arrangements were: (1) to ensure professional development of IT staff and, accordingly, access to industry best practice; (2) to provide variable, secure, and reliable computing capacity; and (3) to permit increased management focus on the distinctive capabilities of the firm—manufacturing and R&D—rather than on computer center operations and other IT activities. BuildCo's outsourcing vendor has helped the firm design and implement a more standardized technology

environment. With the vendor's active involvement BuildCo has implemented a portal and middleware to enhance access to data and enable enterprise-wide solutions. As a strategic partner, the vendor manages most operational IT responsibilities. For example, most IT vendors who solicit IT managers at BuildCo are directed to the outsourcing vendor to make their case. This arrangement preserves management focus for more strategic concerns. BuildCo is developing IT staff who can identify strategic IT solutions and work with the vendor and key business partners to implement those solutions.

Outsourcing for Improved Time to Market

FinCo, a financial services firm, provides an example of an alternative approach to large-scale outsourcing. This firm considers IT operations to be a competitive strength. FinCo has a highly standardized IT environment, which it manages for low-cost and high reliability. Outsourcing vendors have confirmed that the firm would not achieve cost savings by outsourcing its computer center operations. FinCo is transforming to an electronic business. Strategically, senior management has positioned the firm to provide extraordinary personal service through on-line and call center personnel. Thus, FinCo requires timely implementation of state-of-the-art systems. The firm can leverage packaged software but it has constant demands for developing new systems or enhancements to packages. FinCo views outsourcing as a way to supplement its several hundred developers with a capable but variable work force. Accordingly, FinCo has engaged in a strategic partnership with a vendor providing approximately 25% of its application maintenance and new application development staff.

Although FinCo had traditionally boasted strong project management methodology, the outsourcing vendor brought even more rigorous project methodology to the firm's IT management practices. Meanwhile, FinCo's own governance processes apply project evaluation and program management practices to ensure that IT investments target enterprise priorities and that projects sharing new infrastructure requirements are sequenced to experiment with and then implement emerging standards. These arrangements have enabled FinCo to successfully complete ambitious customer service-oriented development projects and improve time to market. The variable work force allows FinCo to establish project priorities according to strategic objectives rather than identify projects to keep all staff gainfully employed.

Neither BuildCo nor FinCo used best of breed outsourcing as a dominant approach to outsourcing, but both did some selective outsourcing of services or projects outside their primary outsourcing focus. BuildCo preferred to limit the number of relationships it had to manage, but noted that competitive bids could keep a strategic partner "on its toes." FinCo occasionally has made selective outsourcing agreements with firms providing unique infrastructure services. Both firms insist that selective outsourcing arrangements conform to their rules (technology standards, user interface, project methodology) to protect and leverage their IT architectures.

Outsourcing for Enhanced Business Experimentation

In contrast to the first two examples, TransCo, a transportation company, has eschewed large-scale outsourcing in favor of smaller, often short-term vendor relationships. This firm, like FinCo, considers IT operations to be a competitive strength and believes it cannot achieve either cost or quality savings through outsourcing. In addition, TransCo takes pride in the professional opportunities it offers to IT developers and has not engaged in large-scale outsourcing of development and maintenance. However, TransCo's strategy calls for leading edge IT applications to provide competitive advantage through innovative customer services and lower cost operations.

TransCo has found significant benefits in working with firms specializing in state of the art technologies and technical solutions. These small-scale partnerships allow the firm to experiment with possible business solutions offered by emerging technologies. For example, TransCo arranged with several technology vendors to develop wireless applications for its workforce. The firm eventually implemented on a large scale only a subset of the experiments, but the outsourcing helped clarify what benefits the firm could generate from wireless technologies. In working with vendors this way, TransCo effectively outsources its R&D efforts through a selective set of partnerships.

Developing an Outsourcing Profile

These three firms' outsourcing arrangements reflect their different objectives for IT. They also reflect the firms' understanding how a vendor could contribute to their existing IT capabilities. BuildCo sought an efficient computing environment built to industry standards. BuildCo's vendor introduced its own highly standardized technology solutions and

provided a computing environment to enable the firm’s adoption of standardized business processes. FinCo sought supplemental IT development resources to meet its heavy new application development requirements. FinCo’s vendor introduced project methodology enhancements while providing a highly skilled variable work force. TransCo sought technology R&D via selective partnerships in which technology firms developed the unique capabilities of their own innovations to help stage business experiments within TransCo.

Much of the discussion of IT outsourcing success has focused on the ability of vendors to cut their clients’ IT costs. The above examples underscore that cost savings is not necessarily the most significant, and certainly not the only, benefit of outsourcing. As firms recognize the IT requirements of their strategic business objectives, they can identify how outsourcers can not only provide a needed service but enhance their existing capabilities.

Planning a strategic outsourcing profile begins with understanding the key gaps between what capabilities IT already provides to a firm and what capabilities the firm most needs. Thus, firms with poorly defined enterprise architectures, inadequate shared services, or IT operations at risk of security

breaches or downtime can benefit from the expertise of vendors providing IT infrastructure and data center operations. Firms attempting to integrate large legacy systems can benefit from the expertise of vendors who provide not only maintenance support but also rigorous methodology and professional development of staff. Firms that have redundant, inconsistent business processes across business units may find value in the offerings of business process outsourcers. Business process outsourcing, like more traditional IT outsourcing, allows a firm to leverage the best practices of a specialist for those processes in which industry standard is the firm’s highest aspiration. Firms can obviously choose to bolster their in-house capabilities rather than outsource, but they may find management attention more valuable elsewhere.

Once a firm understands what it wants to outsource, it can choose between a large-scale partnership or best of breed approach. The decision on how to outsource depends, in part, on how broad a set of services management chooses to outsource. Another critical determinant will be whether the firm prefers to focus on managing a vendor or on integrating individual tasks.³ In any case, firms must plan their outsourcing profiles to enhance rather than “give away” their IT capabilities.

³ Ross and Westerman 2003.

Figure 1: Table of Outsourcing Arrangement Options

	Large-scale Strategic Partnership	Selective, Best of Breed Outsourcing
Infrastructure & Data Center Operations	BuildCo	
New Application Development	FinCo	TransCo
Application Maintenance & Enhancement	BuildCo, FinCo	
Business Processes		

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