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Ritu S. Agarwal
University of Maryland, ragarwal@rhsmith.umd.edu

V. Sambamurthy
Massachusetts Institute of Technology, jross@mit.edu

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PRINCIPLES AND MODELS FOR ORGANIZING THE IT FUNCTION[1]

Ritu Agarwal
University of Maryland

V. Sambamurthy
University of Maryland

Executive Summary

Today, as new information technologies emerge as strategic differentiators, there is renewed interest in finding the best organizational model for structuring and organizing information technology (IT) activities in firms. In our two-year study of how leading-edge firms have designed their IT function to nurture innovation and sustain superior business performance, we uncovered three guiding principles. One, encourage co-evolution of IT and the business. Two, nurture relationship networks. Finally, organize by value-creating process. We also found three organizational models. The Partner Model focuses on making IT an active partner in business innovation. The Platform Model emphasizes providing IT resources for innovation and global reach. And the Scalable Model seeks flexibility by leveraging sourcing to tap innovation outside the firm. All three models embrace the three organizing principles, but each model is appropriate for a specific organizational view of the role of the IT function.[2]

How Should Firms Organize Their IT Function?

How should contemporary firms organize their IT function? Despite more than twenty years of experience and insights, this question continues to dominate the attention and interest of CIOs and senior business executives. During the 1970s and 1980s, firms alternated between centralized models (where authority for the majority of IT decisions was located in the corporate IT group) and decentralized models (where the authority for most IT decisions was located in the divisional or functional IT units).

During the 1990s, many firms gravitated toward the federal organizational model, which dispersed control and authority for IT decisions. Corporate IS groups were vested with authority for IT infrastructure decisions while divisional units had the authority for decisions about strategic deployment of IT.[3] Researchers have concluded that this model of distributed governance and decision-authority is particularly appropriate for large, multidivisional firms because it balances enterprise priorities for scale and IT standardization with divisional priorities for IT innovation in their products, services, or customer relationships.[4]

[1] This article was reviewed and accepted by all the senior editors, including the editor-in-chief. Articles published in future issues will be accepted by just a single senior editor, based on reviews by members of the Editorial Board.

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[3] von Simson, E., "The 'Centrally' Decentralized IS Organization," *Harvard Business Review*, July-August 1990, pp. 158-162.

[4] Brown, C.V. and Magill, S.L., "Alignment of the IS function with the Enterprise: Towards a Model of Antecedents," *MIS Quarterly* (18

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However, the federal model and its distributed governance might not adequately address the strategic, organizational, and technological realities facing today's IT executives, for two reasons.

First, IT now plays a more prominent role in corporate agility, enabling rapid and continual business innovation in products, services, channels, and supply and demand chain management.[5] Hence, firms are investing heavily in enterprise digital platforms (such as enterprise resource planning, customer relationship management, supply chain management, and wireless technologies) to support innovations in their "ecosystems" – that is, their business partnerships with customers, suppliers, and other specialist firms (such as contract manufacturers).[6] Decisions about business innovations require significant levels of collaboration and partnership between IT and business executives.

In their case study of Marshall Industries (now Avnet), El Sawy and his colleagues described how the IT function was organized for continuous IT-based innovation. Teams of IT and business executives responsible for innovation focused on drivers of business success, such as supply chain management and customer order capture.[7] Meanwhile, a small group managed the common IT infrastructure. This structure retains the fundamental characteristics of the federal model, but it emphasizes far greater collaboration between business and IT executives.

Second, today's accelerated rates of technological change and obsolescence in the IT market require organizational models that pay close attention to human capital and relationships with vendors and consultants.[8]

In their case study of Bell Atlantic (now Verizon), Clark and colleagues described an organizational model, called the Centers of Excellence, to develop and leverage human capital.[9] This model has three components:

1) Units called skillcenters focus on developing valued IT skills; IT professionals are assigned to these units to be trained and developed in those skills,

2) Account managers are IT professionals responsible for nurturing strategic ideas about IT use,

3) Temporary project teams are staffed with IT professionals from the skillcenters and are responsible for rapid applications delivery using the specifications created by the account managers.

While this centers of excellence model subscribes to the federal logic, it emphasizes greater centralization than the pure federal model, because most of the IT developers are centralized within the IT skillcenters.

Similarly, Cross and colleagues described British Petroleum's (now BP) IT organizational model that used multisourcing agreements to garner cost economy and flexibility.[10] In this model, the firm partnered with multiple external vendors and systems integrators to manage its IT infrastructure, utility services (e.g., helpdesk), and solutions delivery. Even though the model is consistent with the federal logic, it primarily aims to leverage external partners through a small corporate IS group; a limited number of IS professionals are located in divisions.

As these examples illustrate, novel IT organizational models are emerging. Yet, there has been no systematic effort to document them and examine where each might be appropriate. The field needs fresh thinking on the following questions:

- What principles should be applied to organizing the IT function?
- What IT organizational models are viable today?

:4), December 1994, pp. 371-403; Sambamurthy, V. and Zmud, R.W., "Factors Influencing Information Technology Management Architectures in Organizations: A Theory of Multiple Contingencies," *MIS Quarterly*, (23:2), June 1999, pp. 261-290.

[5] Goldman, S.L., Nagel, R.N., and Preiss, K., *Agile Competitors and Virtual Organization: Strategies for Enriching the Customer*, New York, NY, Van Nostrand Reinhold, 1995; Sambamurthy, V., "Business Strategy in Hypercompetitive Environments: Re-thinking the Role of IT Differentiation," in R.W. Zmud (Ed.) *Framing the Domains of IT Management Research: Glimpsing the Future through the Past*, Pinnaflex Press, 2000; Venkatraman, N and Henderson, J., "Real Strategies for Virtual Organizing," *Sloan Management Review* (40:1), Fall 1998, pp. 33-48.

[6] Barua, A., Konana, P., Whinston, A., Yin, F., "Driving E-Business Excellence," *Sloan Management Review* (43:1), Fall 2001, pp. 36-44.

[7] El Sawy, O., Malhotra, A., Gosain, S., and Young, K., "IT-intensive Value Innovation in the Electronic Economy: Insights from Marshall Industries," *MIS Quarterly* (23:3), September 1999, pp. 305-335.

[8] Agarwal, R. and Ferratt, T.W., "Crafting an HR Strategy to Meet the Need for IT Workers," *Communications of the ACM* (44:7), 2001, pp. 59-64; DiRomualdo, A. and Gurbaxani, V., "Strategic Intent for IT Outsourcing," *Sloan Management Review* (39:4), Summer 1998, pp. 67-80.

[9] Clark, C., Cavanaugh, N., Brown, C.V., and Sambamurthy, V., "Building Change Readiness Capabilities in the IS Organization: Insights from the Bell Atlantic Experience," *MIS Quarterly* (21:4), December, 1997, pp. 425-454.

[10] Cross, J., Earl, M., and Sampler, J., "Transformation of the IT Function at British Petroleum," *MIS Quarterly* (21:4), December 1997, pp. 401-423.

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Table 1: Organizing Principles for the IT Function

Guiding Principle	Recommended Managerial Actions
Organize IT to encourage co-evolution with the rest of the business.	• Design reporting relationships for key IT executives that focus on strategic business drivers. • Engage IT executives in experimenting with new IT-enabled business models and business practices through appropriate incentives.
Organize IT to nurture relationship networks for visioning, innovation, and sourcing.	• Nurture visioning, innovation, and sourcing networks through: 1. Internal coordination mechanisms, including executive councils, IT management councils, divisional steering councils, IT standing teams, account managers, divisional information officers, service level agreements, and informal relationship building. 2. External partnering tactics, such as multisourcing agreements, strategic alliances and joint ventures.
Organize IT function to explicitly manage eight value-creating processes.	• Adopt a modular approach to selecting optimal organizing options for individual value-creating IT processes.

In collaboration with the Advanced Practices Council of SIM International, we recently conducted a two-year study to discover answers to these two questions.[11] After interviewing CIOs and senior IT executives from nearly 30 firms, and conducting in-depth case studies of seven firms in different sectors of the economy, we identified new principles and organizational models for the IT function.

The principles explain how executives can think about organizing the IT function (see Table 1) to boost business innovation. When used to foster different roles for the IT function, they result in three different organizational models (see Table 2). Each model subscribes to the general principles, but combines them in distinct ways to support different value propositions and roles for IT.

First we describe the organizing principles, then the three organizational models. Our goal is to assist senior IT and business executives in assessing the appropriateness of their current IT organizational model and in perhaps determining a more appropriate model. Also, these descriptions respond to researchers' need for fresh insights about organizing the IT function.[12]

Principles for Organizing the IT Function

Three principles underlie new ways to organize the IT function (See Table 1):

[11] Our study included in-depth telephone interviews with CIOs of thirty large firms in a variety of industries (manufacturing, financial services, high-tech, retail, and hospitality) and detailed case studies of seven firms. All of these firms are in leadership positions in their respective industries. Further, their peers and the trade press (*Fortune*, *CIO*, *Information Week*, etc.) regard them as being successful in business innovation through IT and in their ability to manage the IT challenges related to speedy delivery of projects, development and retention of IT human capital, and effective management of IT assets and external relationships.

[12] Sambamurthy, V. and Zmud, R.W., "The Organizing Logic for an Enterprise's IT Activities in the Digital Era – A Prognosis of Practice and a Call for Research," *Information Systems Research* (11:2) June 2000, pp. 105-111.

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Table 2: Features of the Three Organizational Models

	The Partner Model	The Platform Model	The Scalable Model
Strategic Positioning of IT	IT is an active partner in business innovation	IT provides the assets, services, and resources for business innovation across the enterprise	IT provides flexible and scalable resources for the business

Distinguishing Characteristics of the Model	• Business leadership in IT innovation through divisional information officers
	• Corporate IT catalyzes innovation through strategic consulting
	• Explicit focus on three types of costs
	  o Business applications costs
	  o Infrastructure costs
	  o Utility costs
	• Dual, matrixed reporting
		• Corporate IT as the factory: delivery of scaleable, seamless, and flexible infrastructure
		  o Enterprise-wide platform and capabilities
		• Business ownership of IT innovation
		  o Senior executives in business units
		  o Dotted line relationship with CIO
		• Account managers as liaisons between IT and business units
			• Centralized IT organization for leveragability
			  o Cross-unit asset utilization
			  o Centers of Excellence structures for human capital
			• Strong IT presence in business units
			• Multisourcing arrangements
			• Scaling for variable resource needs

Where does this Model Work?	• A need to promote business innovation through IT
	• Business executives lack a deep understanding of IT
	• Organizations with multiple related businesses
	• Strong IT leadership with a history of trust and credibility
		• Global businesses in multiple lines of business
		  o Unique IT needs across units
		• Strong level of IT knowledge among business managers
		  o High-tech sectors
			• Global businesses in related lines of business
			• Cyclical industries

Principle 1: Organize IT to foster co-evolution between the business and the IT function.

The strategic role of IT is to enable innovative business strategies and processes. In the past, IT executives have focused on aligning their function with the business. But alignment can be too static for today's fast pace. A better goal is "co-evolution."

Co-evolution means that the capabilities of the IT function and the rest of the business develop iteratively and reciprocally over time. For example, firms that have developed business capabilities for "direct to the customer" order capture and fulfillment have invested in information technologies that allow customers to access their product databases through portals, configure their orders, and observe the progress on their order through the manufacturing and logistics processes. At the same time, newer technologies, such as personalization, enable companies to develop better business capabilities to customize their relationships with customers. For instance, they can capture and store customer profiles, differentiate customers' various levels of business with the firm, and offer customized pricing and services to individual or clusters of customers. Hence, the IT and business capabilities for customer relationship management intertwine, and develop iteratively over time.

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The IT organizational structure must facilitate such natural occurrences of co-evolution. Although most firms have generally sought to align their IT capabilities with their business capabilities, the IT function's structure must also assist the firm in exploiting such IT-enabled opportunities as virtual integration, direct access to customers, and cross-divisional or business-unit integration.[13]

For example, the executive management team at a large telecommunications firm in our study considered customer advocacy and customer relationships to be the strategic drivers of its business model. Therefore, management focused on facilitating co-evolution of IT and customer-centric capabilities by: (i) having the CIO report to the senior executive responsible for customer advocacy, and (ii) linking business and IT executives' compensation to customer-centric innovation utilizing IT.

Generally, emphasizing co-evolution extends a firm's existing emphasis on strategic alignment, where the IT function is already organized to support business strategies and capabilities. However, co-evolution requires going beyond the alignment model by emphasizing a two-way relationship between the development of business capabilities and IT capabilities. The alignment models have been criticized for placing IT management into a "lag" role – which prevents IT investments and capabilities from potentially shaping business strategy.[14] Alignment thinking precludes our first principle: organizing to foster co-evolution of IT and the business.

Principle 2: Organize IT to nurture relationship networks for visioning, innovation, and sourcing.

Generally, IT decision-making authority has been dispersed. This is not the most effective organizational structure, though, because it does not explicitly foster collaboration among the four stakeholders vital to successful management and use of IT: executive management, business management, IT management, and external vendors (Figure 1). IT's organizational structure must facilitate collaboration among these four to blend their knowledge and influence. We believe that three kinds of "relationship networks" are important for organizing IT activities to foster such collaboration: visioning networks, innovation networks, and sourcing networks.

Visioning networks are relationship networks among senior management and senior IT executives (e.g., the CIO and some of the CIO's direct reports). Their purpose is to foster collaboration among these executives for creating and articulating strategic vision about the role and value of IT in the firm. Visioning networks help top management teams describe their perspectives on the role of IT, their strategic priorities for IT use, and the links they see between IT and drivers of the business strategy.

The primary mechanism for establishing a visioning network is to have the CIO as a formal member of the top management team. Additionally, Rockart and colleagues have noted the trend toward using IT executive councils as a mechanism for visioning networks.[15] These councils include the CEO, COO, CIO, and other senior business executives as members. They devote time to developing, articulating, and maintaining the strategic vision of the use of IT in the firm.

Schein describes four perspectives of the strategic role of IT: automation, informating up to enhance command and control, informating down to promote decentralization and empowerment, and transformation, that is, using IT to reshape competition or the nature of the industry.[16] Visioning networks foster the sharing of such perspectives.

In our study, a large telecommunications firm considered customer relationships to be its strategic value-creating activity; therefore, the strategic role of IT is to enable and shape customer relationships. The visioning network mechanism they used was the CIO's formal membership in the top management team.

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[13] Venkatraman, N., "IT-Induced Business Reconfiguration," in M.S. Scott Morton (Ed.) *The Corporation of the 1990s: Information Technology and Organizational Transformation*, Oxford Press, 1991, pp. 122-158; Venkatraman and Henderson, ibid.

[14] Henderson, J. and Venkatraman, N., "Strategic Alignment: A Framework for Strategic Information Technology Management," in T. Kochan and M. Useem (Eds.) *Transforming Organizations*, Oxford Press, New York, NY, 1992, pp. 97-117; Burn, J.M., "A Professional Balancing Act -- Walking the Tightrope of Strategic Alignment," in C. Sauer and P. Yetton (Eds.), *Steps to the Future: Fresh Thinking on the Dynamics on IT-based Organizational Transformation*, Jossey-Bass, 1996, pp. 55-80.

[15] Rockart, J.F., Earl, M.J., and Ross, J.W., "Eight Imperatives for the New IT Organization," *Sloan Management Review* (38:1), Fall 1996, pp. 43-56.

[16] Schein, E.H., "The Role of the CEO in the Management of Change: The Case of Information Technology," In T.A. Kochan & M. Useem (Eds.), *Transforming Organizations*, Oxford University Press, 1992; Armstrong, C.P. and Sambamurthy, V., "Information Technology Assimilation in Firms: The Influence of Senior Leadership and IT Infrastructures," *Information Systems Research* (10:4), December 1999, pp. 304-327.

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Figure 1: Key Stakeholders in The IT Relational Networks

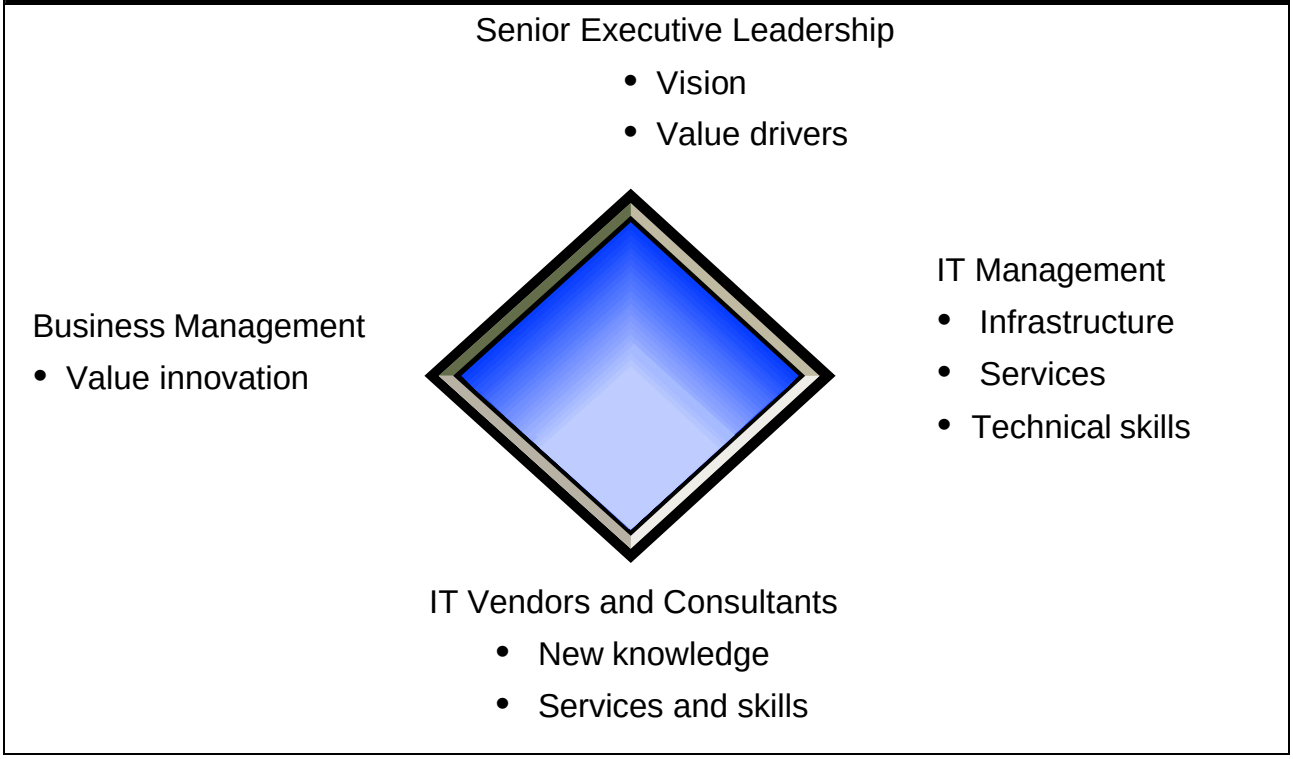

Table 1 shows a variety of mechanisms for all three relationship networks.

Innovation networks are relationship networks between business and IT executives. Their purpose is to foster collaboration between these executives when they are conceptualizing and implementing IT applications – specifically applications that aim to enhance the firm's agility and innovation in customer relationships, manufacturing, product development or supply chain management. Innovation networks can utilize such coordination mechanisms as executive councils, IT management councils, divisional steering councils, IT standing teams, account managers, and divisional information officers.

So whereas visioning networks engage top management to shape overall enterprise perspectives about the strategic role and value of IT, innovation networks focus on specific innovations and strategic IT applications.

In their study of about forty firms, Brown and Sambamurthy found that innovation networks develop both through collaborations between business and IT executives and through collaborations among IT executives dispersed across the enterprise.[17] They also found that firms must use combinations of coordination mechanisms to nurture innovation.[18] Other IS researchers have found that the use of coordination mechanisms increases the likelihood of IT innovation occurring.[19]

Sourcing networks are relationship networks between IT executives and external partners. Their purpose is to foster collaboration between these internal and external parties when they are negotiating and managing efficient, cost-effective, and innovative uses of IT assets and services through multisourcing arrangements, joint ventures, or strategic alliances.

[17] Brown, C.V. and Sambamurthy, V., "Coordination Theory in the Context of the IT Function: Linking the Logic of Governance and Coordination Mechanisms," University of Maryland Working Paper, 2002.

[18] Brown and Sambamurthy, ibid.

[19] Nambisan, S., Agarwal, R., and Tanniru, M., "Organizational Mechanisms for Enhancing User Innovation in Information Technology," *MIS Quarterly* (23:3), September 1999, pp. 365-395; Lind, M.R. and Zmud, R.W., "Improving Interorganizational Effectiveness Through Voice Mail Facilitation of Peer-to-peer Relationships," *Organization Science* (6:4), 1995, pp. 445-461.

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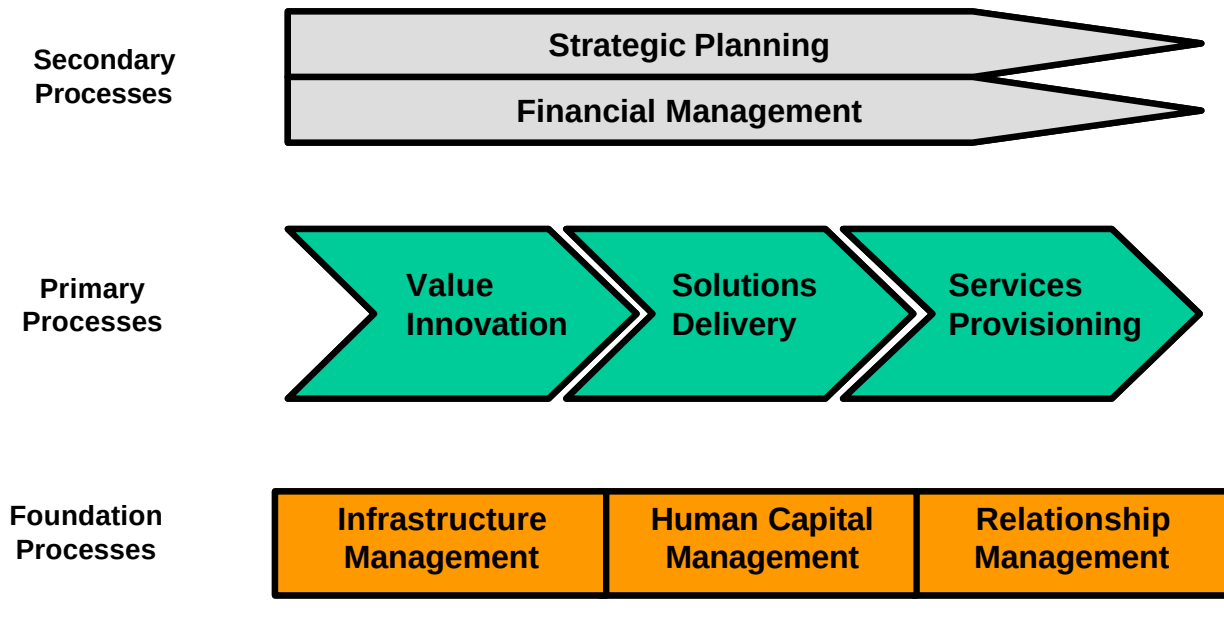
Figure 2: Organizational Building Blocks: Creating Value Processes



DiRomualdo and Gurbaxani demonstrate that sourcing networks can help companies not only lower their IT costs but also augment their IT capabilities and business thinking about innovative uses of IT.[20] Lacity and colleagues have also emphasized the importance of using specific organizational design mechanisms to leverage sourcing networks to achieve more effective management and use of IT.[21]

Principle 3: Organize IT to explicitly manage eight value-creating processes.

In the past, the IT function had been viewed as a monolithic structure, and organizational design has focused primarily on finding the best options to manage infrastructure and deliver strategic IT applications. However, this approach proves to be limiting because IT functions in most modern firms perform a wider range of activities. As information technologies become a strategic differentiator, it is better to think of the IT function as a portfolio of eight value-creating processes – each of which needs to be organized for its own best contribution and leverage. These eight form three sets of processes (See Figure 2 and Table 3), called foundation processes, primary processes, and secondary processes.

Foundation processes relate to creating and managing three fundamental IT capabilities: (1) IT infrastructure, (2) IT human capital, and (3) IT relationships (specifically, partnering with business executives and partnering with vendors and systems integrators). These IT capabilities are at the heart of how IT functions help their business partners differentiate their strategies and nurture continuous innovation through IT.[22]

[20] DiRomualdo and Gurbaxani, ibid.

[21] Lacity, M.C., and Willcocks, L.P, "An Empirical Investigation of Information Technology Sourcing Practices: Lessons from Experience," *MIS Quarterly* (22:3), 1998, pp. 363-408.

[22] Ross, J.W., Beath, C.M., Goodhue, D.L., "Develop Long-term Competitiveness Through IT Assets," *Sloan Management Review* (38:1), 1996, pp. 31-45; Bharadwaj, A., "A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation," *MIS Quarterly* (24:1), March 2000, pp. 169-196; Bharadwaj, A., Sambamurthy, V., and Zmud, R.W., "Firmwide IT Capability: An Empirical Examination of the Construct and its Links to Performance," University of Maryland Working Paper, 2002; Feeny, D.F.and Wilcocks, L.P., "Core IS Capabilities for Exploiting Information Technology," *Sloan Management Review* (39:3), Spring 1998, pp. 9-21; and Marchand, D.A., Kettinger, W.J., and Rollins, J.D., "Information Orientation: People, Technology,

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Table 3: Value-Creating Processes in the IT Function

Process	Description	Example Organizing Options
Infrastructure management	Building and managing the blueprint for investing in computing, networking, database, object-base, and other key infrastructure technologies. Includes establishment and management of IT infrastructure standards.	• Centralized • Outsourced • Leased
Human capital management	Identifying the know-how the IT function needs to possess, with respect to technology, business, and strategy. Acquiring, developing, and retaining IT talent.	• Centers of excellence
Relationship management	Partnering with internal clients, external vendors, and business peers to develop a shared understanding of IT's vision and role. Managing expectations across stakeholder groups.	• Formal councils and cross-functional teams • Job rotation • Alliance management teams • Informal one-on-one relationships
Value innovation	Strategic analysis of IT-based business opportunities and creative conceptualizations of ways in which IT can be used to strengthen business competencies, customer relationships, and business partner networks.	• Centralized, with account managers for individual units • Centralized, with mirror image units for individual businesses • Decentralized • Federal
Solutions delivery	Analysis of business needs for IT, conceptualizing of IT applications, and delivery of applications either through internal development, external contracting, or integration of packaged software.	• Centralized • Federal • Outsourced • Independent IT subsidiary
Services provisioning	The provisioning of utilities, such as the data center, and services, such as helpdesks and desktop management, for users across the corporation.	• Centralized • Decentralized • Outsourced
Strategic planning	Enterprise-wide activities aimed at establishing strategic business thrusts and determining how strategic IT thrusts will support the business.	• Centralized • Federal
Financial management	The structuring of service level agreements, tracking and benchmarking the costs of IT services, and developing the business case and ROI analyses of IT infrastructure investment proposals.	• Centralized

Primary processes are those that must be managed in every IT function, to convert foundation IT capabilities into business applications and services. Three primary processes are (4) value-innovation (that is, conceptualizing strategic IT needs and opportunities in the form of applications), (5) solutions delivery (building IT applications), and (6) services provisioning (i.e., providing helpdesk, desktop configuration, and other support IT services). They are like the front office of IT or the touch points through which business clients perceive the quality, contributions, and effectiveness of the IT function.

and the Bottom Line," *Sloan Management Review* (41:4), Summer 2000, pp. 69-80.

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Secondary processes are those important to the well-being of an IT function. Their contribution is exhibited by how well they support the foundation and primary processes. These two processes are (7) strategic planning and (8) financial management.

We recommend that IT management think modularly by selecting the best organizing option for each of the eight value-creating processes.[23] For example, in most firms, it is appropriate to manage the IT infrastructure through a centralized IT unit, to outsource specific infrastructure services (such as, web hosting), and to lease desktops for a faster technology refresh (for example, every two years). Such organization permits more rapid changes than decentralized IT or complete in-house sourcing of infrastructure services. Similarly, when it comes to organizing solutions delivery, possible choices include a corporate IT unit, divisional IT units, or strategic partnerships with third-party solutions developers.

Based on our research, Table 3 shows some of the appropriate choices for organizing each of the eight value-creating processes in today's firms. By thinking modularly, management chooses an option for each, and manages them all as a portfolio of activities within the IT function.

Modular thinking promotes flexibility in organizing the IT function. When changes in the business, technology, or the firm require attention to a specific value-creating process, IT functions that employ modular thinking can change the organizing option for just that process. For example, relying on packaged solutions rather than in-house coding can shift a firm's reliance from large internal applications development groups (either at corporate or in divisions) to sourcing relationships with systems integrators. If IT then needs to modify its solutions delivery process to adjust to, say, an organizational change, it can do so without significantly altering the IT function's overall structure. Similarly, companies can emphasize human capital management by recentralizing IT staff or creating centers of excellence, each focusing on specific systems. These structural shifts can be localized to human capital management only, and not require significant changes to other IT functions.

Taken together, these three principles represent fresh thinking about organizational design of the IT function, emphasizing co-evolution rather than alignment, emphasizing relationship networks that foster collaboration rather than dispersing IT decision-making authority, and emphasizing modularity in the IT function around value-creating processes rather than creating monolithic organizational architectures.

Three Organizational Models for the IT Function

In our research, we uncovered three viable IT organizational models. All draw upon the principles, yet have distinct goals.

The Partner Model, the first model, primarily aims to ensure that the IT function is an active and direct participant in collaborating with business executives to make business innovation through IT a reality.

The Platform Model, the second model, primarily aims to ensure that the IT function provides the assets, services, and resources for business innovation across the enterprise. Thus, the IT function acts as an enabler of innovation rather than as a direct catalyst for innovation, as in the Partner Model.

The Scalable Model, the third model, primarily aims for maximum flexibility in its people resources, so that the IT function can expand and contract in concert with business cycles. A salient aspect of this model, in contrast with the other two models, is that it makes extensive use of sourcing relationships with vendors and systems integrators to achieve flexibility in IT resources. This model seeks to facilitate IT-based business innovation without committing significant organizational investments to in-house IT resources.

The Partner Model: Being a Catalyst for Innovation

In this organizational model, IT is a proactive partner in the innovation process. It stimulates, catalyzes, and "seeds" thinking about strategic uses of IT. In particular, this model facilitates co-evolution through vigorous collaboration between business and IS executives, in both devising IT-enabled business capabilities and in setting the direction and timing of future IT capabilities.

The Partner Model focuses on innovation networks (from Principle 2) and emphasizes three value-creating processes in designing the IT function: value-innovation, relationship management, and financial management (in Principle 3).

[23] Agarwal, R. and Sambamurthy, V., "Modus Operandi," *CIO Insight* (1:8), December, 2001, pp. 27-32.

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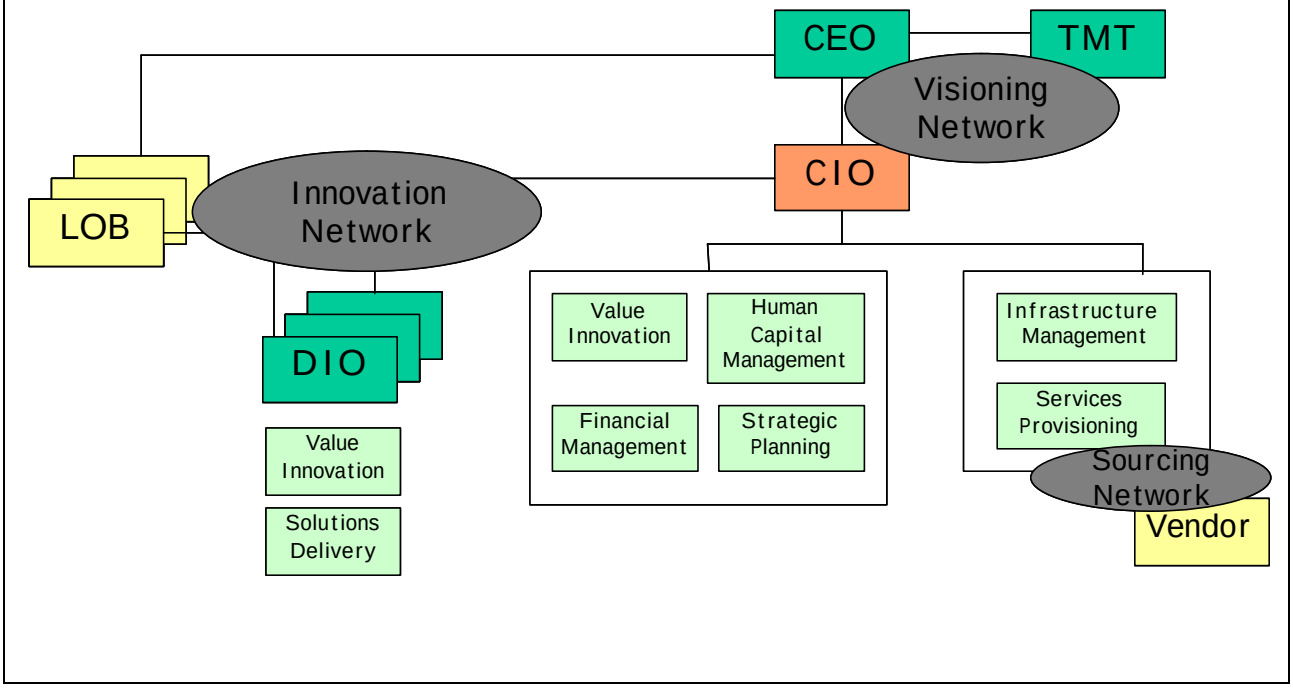
Figure 3: The Partner Model



A large hospitality firm. A primary example of the Partner Model in practice is at a large hospitality firm.

Principle 1: Co-evolution. When the current CIO arrived at this firm, IT was adequately aligned with the business strategy and adequately supported it. However, responding to the Internet, globalization, and competitive rivalry would require greater attention to business innovation and agility through IT. Corporate management expected IT to shape value-added services and relationships with customers and enhance brand equity. At the same time, to further develop customer relationships and heighten brand management, the firm became interested in using personalization, data mining, and wireless mobility technologies. In short, the firm realized it needed to transform IT from an alignment to a co-evolution mindset.

Furthermore, the CIO realized that the critical success factor for IT would be the effectiveness of the innovation network: how well IT and business executives would collaborate in generating a stream of innovative IT applications and in making IT investment choices. Finally, the CIO realized that success of his organizational model would hinge on the quality of the value-innovation process and how well this process blended IT and business capabilities and resources.

Principle 2: Relationship networks. Figure 3 shows the organizational model of the IT function at this hospitality firm. To sustain co-evolutionary thinking and strengthen the role of IT as a strategic differentiator, the CIO reported to the CEO and became a member of the senior executive leadership team. As illustrated in Figure 3, his membership in the top management team built the visioning network. The group recognized the transformative power of IT for their customer relationships, so they could provide the vision for directing IT innovation in customer-facing activities.

The firm's innovation network is promoted through interactions among Divisional Information Officers (DIOs) and their business peers in the lines of business. In addition, a limited set of partnerships with external vendors exists, providing sourcing networks, even though sourcing networks are not as salient at this firm as the other two types of relationship networks.

Three specific characteristics of this firm's organizational model warrant mention.

First, the divisional information officers are located in business units to strengthen the innovation networks.

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They report both to the CIO and the president of their business unit. They collaborate with their business peers on two value-creating processes: value-innovation and solutions delivery. As members of their divisional executive team, they stimulate IT innovation in their division's business. They also belong to the IT management council (which comprises all senior IT executives and the CIO), so they share their division's IT needs, priorities, and issues with the rest of IT management. These interactions are important in shaping IT investments and priorities.

Second, to further strengthen value-innovation, a small strategic consulting group within corporate IS proactively seeds strategic thinking and innovation across the enterprise. This group of business and IT consultants works with the divisional information officers and executive teams in applying strategic thinking to IT-enabled opportunities and threats. The firm's business and IT executives attribute the success of their IT innovation activities to this strategic consulting group.

Third, the CIO and senior IT executives recognized that partnerships would be less effective if the business units did not fully understand IT costs. Therefore, the organizational model focuses on three types of IT costs: business applications costs, infrastructure and utility costs, and overhead costs. Management of costs can be seen as relating to the management of value-creating processes, Principle 3.

Principle 3: Value-creating processes. Business divisions own their own business-applications costs because their executives develop the business cases for projects and provide the necessary funding. The division information officers assist the business executives in developing the business justification for projects and managing solutions delivery costs. Thus, applications costs are fully vested within the divisions.

Infrastructure and utility costs are managed as shared services and apportioned to divisions through chargebacks, which are negotiated annually with the divisions. The firm periodically benchmarks these utility and infrastructure costs to reassure division management of their low-cost competitiveness. IT management also uses the chargebacks as a partnership-building mechanism. Overall, their success is consistent with the observations of Ross and colleagues, who found that the biggest promise of chargebacks lies in fostering harmonious and trustful partnerships between IT and business units.[24]

Finally, overhead costs reflect the value-creating processes of strategic planning, financial management, and human capital management. The costs are incurred by the Office of the CIO and are managed as corporate headquarters costs.

Overall, by distinguishing among the costs of applications, infrastructure and utilities, and overhead, the hospitality firm's IT organizational model contributes significantly to creating enduring and amicable partner relationships.

Summary. This Partner Model is most appropriate for firms that want to promote business innovation through IT, but whose business executives lack a deep understanding of IT. The model provides pathways for business and IT executives to collaborate in innovation activities. This model is also appropriate for multidivisional firms that operate in related lines of business and seek to exploit cross-divisional synergies through IT-based innovations. Examples of such synergies include common customer relationship management, supplier management systems, and cross-business "bundled" offerings of products or services. Finally, this model works in firms that have strong IT leadership, and a history of trust and credibility between IT and the business. Harmonious and vibrant business-IT partnerships are likely to form and sustain IT innovation in these firms because the business managers are likely to be receptive to IT "seeding" ideas for IT innovation.

The Platform Model: Providing the Resources for Global Innovation

This model is appropriate for organizations where IT is primarily expected to provide infrastructure and tools to enable current and future business innovations – in products, services, processes, or channels. The IT function excels in delivering a global infrastructure and services, and in rapidly delivering IT solutions. The IT function's primary goal is to "be a business within the business of the firm," delivering a scalable, seamless, and flexible infrastructure, productivity tools for knowledge workers, and technologies and applications for global team collaboration.

In contrast with the Partner Model, IT is not expected to be an active collaborator in initiating business innovations. Instead, it focuses on developing an enter-

[24] Ross, J.W., Vitale, M.R., and Beath, C.M., "The Untapped Potential of IT Chargeback," *MIS Quarterly* (23:2), June 1999, pp. 215-237.

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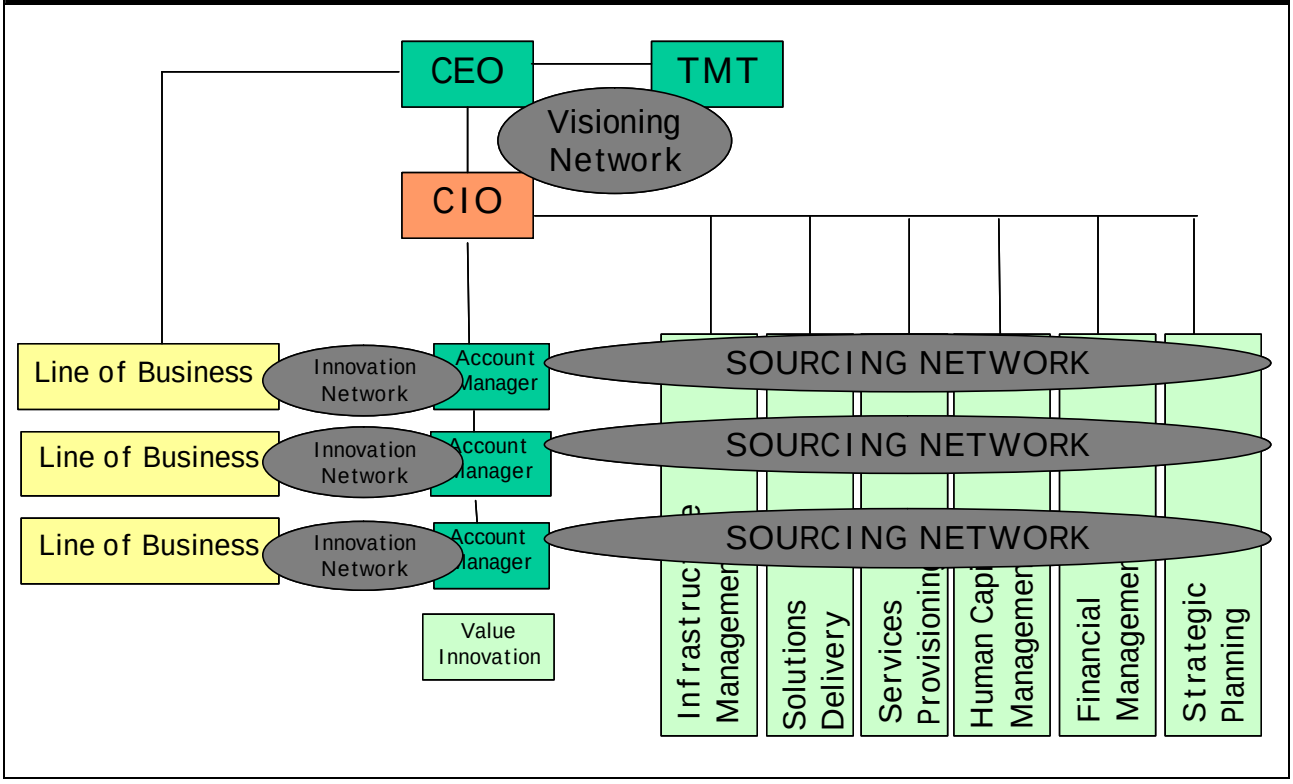
Figure 4: The Platform Model



prise-wide platform and capabilities, which can be consistently and repeatedly leveraged in strategic IT applications.

Within this model, the principle of co-evolution occurs through the actions of account managers, who act as liaisons between the IT function and the business units. They collaborate with business unit executives in directing IT capabilities toward developing and maintaining business unit capabilities. At the same time, they identify IT capabilities needed for future business opportunities or growth, and they sensitize corporate IT to future business needs for IT enablement.

The Platform Model utilizes both innovation and sourcing networks. Account managers facilitate the value-innovation process in the business units. At the same time, the managers for the other value-creating processes – particularly infrastructure management, solutions delivery, and services provisioning – develop the needed IT capabilities in their areas so that they will be the preferred provider of choice to the business units.

A large high-tech firm. The IT function of a large, multidivisional high-tech firm, which is a market leader in semiconductors and telecommunications, illustrates this Platform Model (Figure 4). Its business executives are quite knowledgeable about IT and are therefore willing to lead IT innovation. Even though IT provides "seed" ideas for innovation, the organizational philosophy and the IT savviness of the business executives make IT's primary role one of enabling and facilitating innovation through a world-class IT infrastructure and rapid applications delivery. In contrast with the hospitality firm, IT is not expected to be an active collaborator in innovation. However, it is expected to be world-class in managing IT: controlling interaction costs, providing IT infrastructure services and applications delivery, and being effective in anticipating and responding to the business unit IT needs.

Principle 1: Co-evolution. At this high-tech firm, account managers and line-of-business executives are responsible for co-evolution of business and IT capabilities (Figure 4). The line executives apply IT in developing business capabilities, collaborating with the account managers. The account managers also inform the rest of the IT function about needed future IT capabilities.

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Principle 2: Partnership networks. The Platform Model focuses on innovation and sourcing networks, and less so on visioning networks. At this firm, innovation networks are nurtured through interactions between the account managers and the line executives.

Principle 3: Value-creating processes. While the account managers report to the CIO, they are viewed as advocating the value-innovation process in the business units. In addition, the IT function is organized around the value-creating processes of infrastructure management, solutions delivery, services provisioning, financial management, strategic planning, and human capital management. The CIO's direct reports manage each of these processes and are accountable for their excellence.

This firm draws on three significant characteristics of organizing via value-creating processes. First, account managers are viewed as facilitators of the value-innovation process, even though the business unit executives are in charge of the process.

In their role as facilitators, the account managers seek to understand their business clients' needs. They then plan product or service roadmaps to meet those IT needs. Where mandated, they must follow corporate IT infrastructure standards. Elsewhere, they can offer optional IT infrastructure services as either tiered or as pay-per-view services. They can also develop new IT products and services by collaborating with the IT executives responsible for the other value-creating processes. Finally, they coordinate delivery of IT services to the business units. Thus, they provide the "one-face window" into IT, they own the end-to-end client experience, and they are the ones responsible for assuring satisfaction with the IT services.

Second, the other value-creating processes are managed to enable innovation in the business units. The IT executives who manage infrastructure management, solutions delivery, and services provisioning, in particular, are accountable for world-class excellence and for being the provider of choice to the business units.

Account managers have the discretion to procure services from these internal sources or from external vendors. Therefore, the executives for IT's internal value-creating processes face outside competition and pressures to be efficient, economical, and effective service providers. Their revenue comes from the business units and is generated by the account managers. Generating revenue is part of the account managers' IT job. On the other hand, the other IT value-creating processes – financial management, strategic planning, and human capital management – "manage the business of IT."

Third, the account managers (because they are the IT executives responsible for the value-innovation process), along with the leaders of the other value-creating processes and the CIO collectively manage the IT function. They form the global IT management council and shape IT strategies, policies, and tactics. They meet semiannually to discuss client-related, strategic and operational, and short-term and long-term issues facing the IT business.

Summary. The Platform Model is most appropriate for global multidivisional firms that operate several distinct lines of business in which the business units have unique IT innovation needs. Following this model allows the IT function to respond in customized ways to the business units – from a common base of IT assets, skills, and investments. Thus, the firms can reap IT economies of scale even though the individual units use IT in unique ways.

The model is also appropriate for firms with IT-savvy business executives because it positions the IT function as the partner of choice in delivering solutions to the business executives' innovation ideas. Thus, the Platform Model is particularly appropriate for high-tech firms – those with a CEO or business executives with information technology backgrounds – because these business executives are most likely to take responsibility for the value-innovation process.

The Scalable Model: Using Sourcing to Be Flexible

This organizational model is appropriate where IT is viewed as a strategic differentiator and an important element of business innovation, and corporate strategy is built around strategic flexibility – that is, being able to quickly acquire resources when a market opportunity appears and, conversely, quickly shed resources when an opportunity becomes unprofitable. Firms that operate in a cyclical business environment also want the least fixed costs and committed resources, so they can expand and contract in response to their business environment. The Scalable Model is designed to enable flexible staffing and to enhance the IT function's ability to scale up and down along with business growth and contraction while continuing to nurture business innovation.

In this model, co-evolution relates to strategic flexibility: IT capabilities are used to build business capabili-

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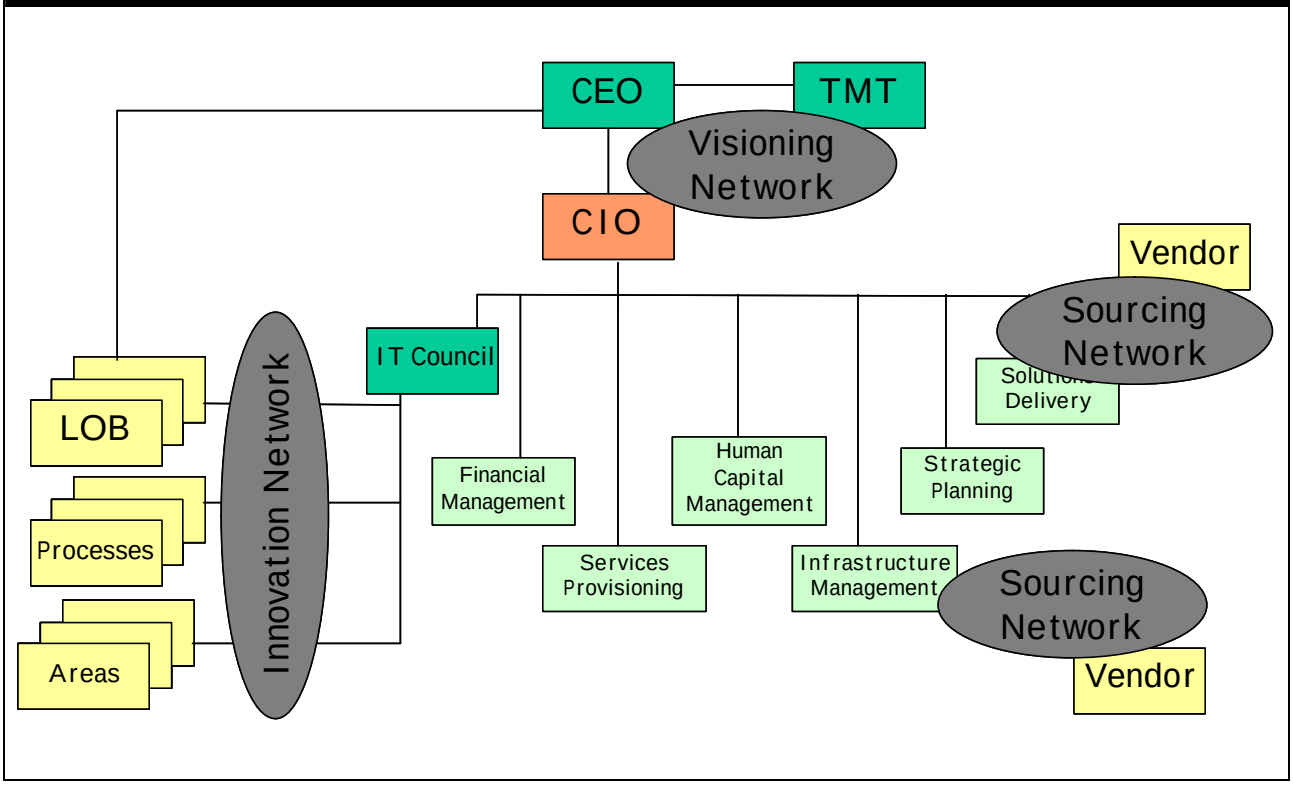
Figure 5: The Scalable Model



ties that enable the firm to quickly seize new business opportunities or exit unprofitable ones. For example, the IT function can contribute to evolution by developing standardized IT-enabled processes and codified knowledge, which the business can then use to replicate itself in other parts of the world and more quickly enter new markets. The business can contribute to evolution by learning from current business activities and anticipating future business opportunities, thereby influencing development of new IT capabilities. Co-evolution occurs through collaboration of senior IT executives with managers of business units, processes, and geographical regions.

The Scalable Model emphasizes sourcing networks to leverage external partners, particularly for two IT value-creating processes, solutions delivery and services provisioning. Creative sourcing relationships permit the IT function to control IT costs while changing staff size in response to cyclical business conditions.

A large chemical firm. A large chemical firm that sells to businesses and aims to be the low-cost leader uses the Scalable Model (Figure 5) to leverage common business processes across its businesses and global markets. Given the vagaries of its cyclical industry, the firm values strategic flexibility so that it can contain costs in downturns and expand resources during growth times. IT has emerged as a strategic differentiator; its role is to facilitate low-cost leadership and strategic flexibility.

Principle 1: Co-evolution. Senior IT executives are located in processes, businesses, and geographic regions, and are responsible for the IT activities in their area. They have a dual reporting relationship to the CIO as well as their process owner, business unit head, or geographic region head. They belong to the CIO's global IT council and thereby provide links between the IT unit and the individual processes, businesses, or regions. This structure facilitates co-evolution by allowing the business capabilities to be shaped through IT capabilities, while ensuring that IT investments are influenced by business capability needs.

These senior IT executives are encouraged and rewarded for value-innovation, which requires them to understand what their business clients need. The firm uses a variety of formal methodologies to foster value innovation – including opportunity analysis, value assessment, and balanced scorecards.

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Principle 2: Relationship networks. Solutions delivery is managed through relationships with external partners. In a cyclical industry, this chemical firm needed an innovative way to manage demand for IT applications. Periods of rapid growth would accelerate demand for skilled IT developers, while periods of business contraction led to IT staff reductions. To better manage demand for IT staff, the firm formed a consulting alliance to garner a "variable sourcing strategy for solutions delivery." The firm has a small in-house application development staff and obtains the rest from its consulting partner. It commits to pay for a minimum number of the consulting partners' people. When it needs more people, the consulting partner provides them at additional cost.

An alliance management office, with representatives from both parties, assigns the IT developers to individual projects. Another group, called the program management office, also with representatives from both sides, keeps track of the status of the various projects and the skills likely to be needed on future projects. These two bodies – the alliance management office and the program management office – are the firm's main sourcing-network mechanism, to manage their relationship with the external solutions delivery partner. Similarly, the firm utilizes external partners for infrastructure management, particularly desktop and telecommunications management.

Principle 3: Value-creating processes. Services provisioning is managed by a unit within corporate IT, even though its members are geographically dispersed and co-located with processes, businesses, and geographic regions. Human capital is nurtured through skill centers that focus on specific IT skills. These skill sets are identified by the program management office. Thus, the firm's value-creating processes are managed separately, sometimes utilizing external partners.

Summary. Global firms in related lines of business can benefit from the Scalable Model because its structure allows the IT organization to efficiently identify opportunities for value innovation and exploit enterprise-wide synergies. Aligning IT executives with multiple horizontal views of the firm (i.e., processes and geographic areas) and vertical views of the firm (businesses) ensures that the IT function is tightly woven into the business. The IT Management Council then brings these executives together to share ideas and insights, providing a business-based view of the enterprise as a whole.

When value is created through connectivity and standards, as is typically the case with global businesses with "similar" products, the Scalable Model explicitly directs managerial attention to these standards, through its emphasis on centralized procurement of services and centralized management of IT competencies.

In addition, the Scalable Model allows firms in cyclical industries to maintain flexibility. Through creative sourcing arrangements that permit speedy commitment to and divestiture of human capital, the model insulates the IT function from potential criticisms of being a cost drain on the business when the industry is in a recessionary cycle.

Conclusion

The purpose of creating principles and models for organizing IT is to facilitate executive thinking about positioning IT as a strategic differentiator. Our findings suggest that there is no single "best" IT organizational structure or governance arrangement because IT needs to respond to the unique environments within which it exists. We offer three models as benchmarks or archetypes for CIOs to consider in reassessing their organization's design. We further recommend a simple, four-step redesign process.

First, enumerate IT's value propositions. Using a visioning network, as described earlier, develop consensus with your business partners on IT's value propositions. These propositions need to embed senior management's views about the role of IT, articulate the ways in which IT delivers business value, and serve as the crucial foundation for organizing IT.

Second, determine which model comes closest to your situation. Juxtapose your IT value propositions, the nature of your business, your industry environment, and the IT sophistication and knowledge in your business units. This combination should point to one of the three models as the most appropriate, because, as noted, each model requires executives to focus on a different set of value-creating processes and relationship networks. Furthermore, each model highlights different strengths of coupling between IT and the rest of the business. Once these needs are understood, you can select the appropriate organizing options (i.e., governance and sourcing arrangements) for each value-creating process.

Third, manage the organizational transformation associated with the new design. This transition includes communicating the vision and rationale underlying the

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design, actually implementing the new organization, and initiating an assessment process.

Fourth, continue to reassess and adapt the organization design to ensure its continued relevance. Organizational designs will not be static. Fortunately, thinking modularly about value-creating processes (Principle 3) limits the potentially disruptive ripple effects that structural changes can cause.

Hopefully the organizing principles and models described here will stimulate CIOs and academic researchers to think about alternative approaches for organizing IT activities to meet today's business demands.

About the Authors

Dr. Ritu Agarwal (ragarwal@rhsmith.umd.edu, www.rhsmith.umd.edu/dit/faculty/agarwal.htm) is an Associate Professor of Information Systems at the Robert H. Smith School of Business, University of Maryland, College Park. Her current research focuses on IT-enabled firm alliances, the management of IT human capital, and organizational adoption and diffusion of emerging information technologies. She has published widely on information technology management topics in journals such as *Information Systems Research, MIS Quarterly, Communications of the ACM,* and *IEEE Transactions,* and works closely with industry executives in the conduct of her research. She is a Senior Editor at *MIS Quarterly* and Associate Editor at *Information Systems Research.*

Dr. V. Sambamurthy (smurthy@rhsmith.umd.edu, www.rhsmith.umd.edu/dit/faculty/sambamurthy.htm) is Associate Professor of Information Systems at the Robert H. Smith School of Business, University of Maryland, College Park. His research examines issues about the strategic management of technology from the perspectives of CIOs and top management teams. His work has been published in journals such as the *MIS Quarterly, Information Systems Research, Decision Sciences, Management Science, Organization Science,* and the *IEEE Transactions on Engineering Management*. Currently, he serves on the editorial boards of *MIS Quarterly, IEEE Transactions of Engineering Management, Information Systems Research, Management Science,* and the *Journal of Strategic Information Systems*. He has researched IT management at, or consulted with, several well-known firms including 3M, General Dynamics, Owens Corning, Intel, Bell Atlantic, Freddie Mac, and BellSouth.

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