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TRANSFORMATION OF THE IS ORGANIZATION: FROM "TECHNICAL PORTFOLIO" TO "RELATIONSHIP PORTFOLIO"

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Abstract

The traditional information systems (IS) organization is analogous to a "technical portfolio" that is characterized by: (1) the acquisition of IS-based competences from internal arrangements (e.g., line management obtaining services from the corporate IS department); and (2) the concentration of decision rights on the use of IS within the central IS division (e.g., end-users having to conform to IS policies that invariably originate from the IS division).

In this paper, we argue that the emergent IS organization is more appropriately referred to as a "relationship portfolio." By this, we mean that IS-based competences are now sourced from inter-organizational arrangements, where vendors might play a critical role in providing the necessary capabilities. Further, IS decision rights are now distributed to line management, where the users have a greater autonomy in leveraging the systems and applications for maximal benefits. We provide a set of prescriptions for managers in positioning the IS organization within the context of our framework.

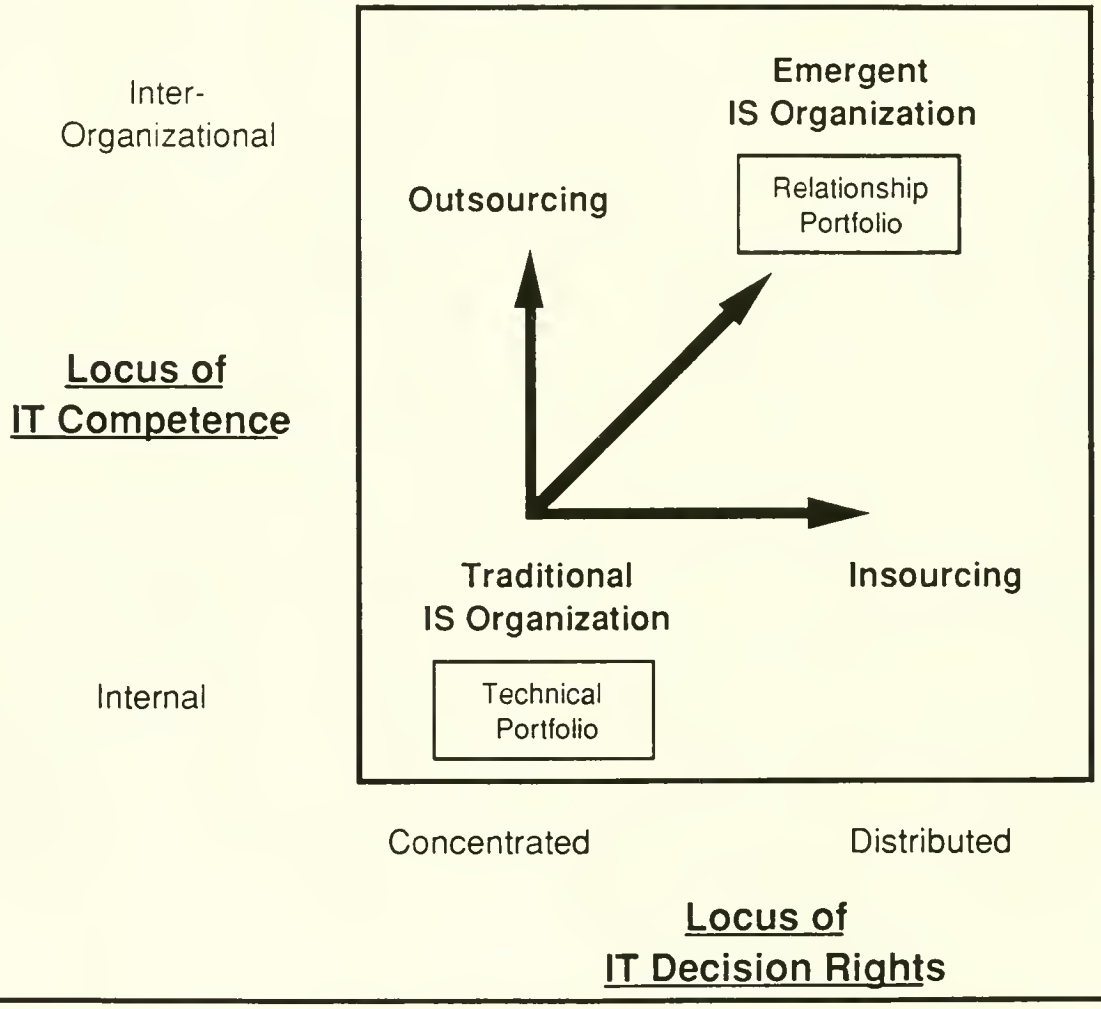
We entered the decade of the 1980s with a high level of expectations from the corporate information systems (IS) organization. Articles in several journals extolled the virtues of information technology (IT) and dealt with such exciting themes as "IT for competitive advantage" or "strategic IS." At the end of the decade, we have all realized that no single system or technology -- however powerful or proprietary -- provides a sustained source of strategic advantage and that the real benefits from IT accrue to those organizations which have *redesigned their business processes* (both inside the firm as well as in the relationships with external participants such as suppliers, buyers, and intermediaries) or have *reconfigured the logic of their IS organizations.*

We have entered the decade of the 1990s, however, with a high degree of dissatisfaction with the traditional logic of managing the IT function as a central custodian of systems and applications or as a cost center. Indeed, the need for a new logic for the IS organization has not yet been articulated to the satisfaction of the professional community. Managers -- both business and IT -- are thus confronted with pressing questions such as: "How should we organize our IS operations? Should we adopt a centralized organization that maximizes operational efficiency or a decentralized organization that maximizes the users' capability in exploiting IT resources for business profitability? Should we outsource our IT activities to the vendor community that has the best set of competences to manage it? Does IT outsourcing really mean loss of competitive advantage?"

Insightful answers to such questions require detailed contextual assessments and cannot be provided on a universal basis. However, in this article, we propose a generic framework to guide senior managers in making

important decisions on the logic of the IS organization. This framework is predicated on the authors' ongoing MIT Study on IT Strategy that examines the strategic role of IT in supporting and shaping business strategies within leading *Fortune 500* firms. Figure 1 is a schematic representation of the framework that is based on two underlying dimensions: *locus of IT competence;* and *locus of IT decision rights*. The accompanying sidebar #A describes the four distinct positions of the framework.

Figure 1: Shifts in the Logic of IS Organization



Issue#1: Where is Your Locus of IT Competence?

The vertical dimension in our framework articulates the locus of a firm's IT competences -- ranging from internal to inter-organizational (involving an array of external organizations in addition to the user firm). This dimension reflects an emerging but compelling trend that firms should look beyond their IS organizations to exploit IT functionalities as a potential source of business advantage.

Historically, the locus of IT competence rested within the internal IS organization which decides on the "make-versus-buy" choices for its operations. Over the last two years, the IT vendor community -- in the wake of fierce competition and depressed margins for its products -- is steadily shifting from selling products toward managing the user firms' IT operations. A recent advertisement by Martin Marietta Information Systems Group illustrates this trend: "You don't own a power plant for your electricity ... Why own a data center for your information systems?" In fact, large outsourcing vendors such as Andersen Consulting, Computer Sciences Corp. (CSC), EDS, and IBM have aggressively increased their emphasis to form various types of business arrangements with a variety of user organizations.

The interest in inter-organizational alliances as a way of obtaining the required IT competences reached a new height when IBM announced "an unusual agreement under which it will build and operate a data center for Eastman Kodak" and that IBM will "take over the work done by four Kodak data centers and 300 Kodak workers will become IBM employees." Howard Anderson of The Yankee Group commented that this arrangement "was the watershed event [and] the fact that Kodak is doing this sends a message that it is OK" to consider new approaches in managing the IT activities. E.O. Stout,

Vice President of Navistar remarked that "the Kodak move legitimized and energized the outsourcing avenue."

We are clearly not advocating that every firm should follow the Kodak model. Our view is that every firm should recognize the continuum in the range of options that are available for obtaining the IT competences especially the inter-organizational options such as: cooperative R&D activities with vendors to develop next-generation applications, minority equity investments in start-up companies that could potentially offer significant new IT applications, outsourcing of non-strategic areas, licensing of emerging technologies as well as joint ventures to create IT-based business competences for the future.

Issue#2: Where is Your Locus of IT Decision Rights?

The horizontal dimension in our framework deals with the locus of IT decision rights -- whether it is concentrated or distributed among a set of managers within the firm. The late 1980s has been marked by a pronounced trend to decentralize not only the IS but also to distribute IT-related decisions, such as: human resources management and systems development. This is because concentration of *all* IT decisions is clearly inappropriate for today's business environment that is marked by the need for quick response to fast-changing market conditions as well as the use of highly diverse technological platforms. At the same time, there is an overpowering need for the centralization of some decision areas such as: choosing an IS architecture, leveraging shared resources, exploiting critical skills and expertise as well as managing external alliances and partnerships. This need arises as complete distribution of decisions -- in the absence of a coherent approach for coordination -- leads to inefficient and ineffective operations.

In the 1990s, the distribution of decision rights is further complicated by the fact that some of these critical decisions fall within the domain of different external partners involved in delivering the required IT competences for the firm. The question often asked by managers of business units with decentralized IS departments is: "do we have the decision-authority to enter into IT-based business relationships without referring it to a central coordinating body?" This is fundamentally different from the question of whether the business units can deviate from the established procedure for *buying* hardware or software products. The risks associated with uncoordinated procurement of products relate primarily to incompatibility resulting in operating inefficiency of a short-term nature. On the other hand, the risks associated with uncoordinated formalization of inter-firm business relationships result in a long-term weakening of the company's ability to form subsequent alliances and partnerships.

More importantly, even when such business relationships are centrally coordinated, particular care should be taken to spell out the allocation of decision rights between the focal firm and the external partner: "who has what authority over what decisions and what mechanism is in place to resolve disputes?" Two reasons exist for the need for greater clarity in the distribution of decision rights. *One*, each relationship deals with an uncertain future -- with high risks and associated possibility of high returns -- and consequently a likelihood of conflicts. Articulation of the mechanism to resolve them would go a long way in minimizing the disruptive effects of such conflicts when they do arise. As an example, when Freeport-McMoRan switched its outsourcing contract last May from EDS to Andersen, Computerland, and IBM because their computing needs changed

unexpectedly, the existence of contractual penalties enabled a smoother transition than would have been otherwise possible.

Two, the relationship with one external partner is not independent of the relationship with another partner. These relationships are intricately interwoven although every firm tries to treat each one as independently as possible. Contractually, they may be independent but the domains of decision-making clearly overlap and should be recognized by the managers involved in the formalization of these relationships. Again, in the case of Freeport, the distribution of decision rights for the same client-server environment -- previously with vendor -- now has to be allocated and managed across a trio of different partners.

Where are You Positioned in the Framework Now?

The first question that every CIO should ask is: "where is our IS organization positioned in this framework *now* and why?"

We envisage that most IS organizations are currently positioned in the lower-left corner of the framework, that is, as a portfolio of technologies. In other words, the IS organization is being managed as a set of systems and applications with the accompanying technical personnel. In our study involving 159 CIOs of Fortune 500 firms, we found that over 80% are indeed located here. This position has certain intrinsic advantages: coordinated development of IT competences, efficient utilization of IT resources, standardization of systems and applications as well as a coherent approach to dealing with external IT vendors. The disadvantages of this positioning stem mainly from the inability to be responsive to the different requirements of the users and potentially excessive bureaucracy. Thus, it is not surprising that

we observe a steady shift by several organizations to move away along both axes.

The movement along the horizontal axis that we term as *insourcing* (see sidebar#A) is more pronounced in cases of organizations with diverse business units competing in different markets. Here, a greater emphasis is placed on distributing the decision rights to the business units. In our study, nearly 30% of the organizations have attempted some sort of rationalization and distribution of decision-rights to the users. The underlying logic for this mode is that user units within the firm continue to obtain the required IT competences inhouse despite having the option to seek them externally. What is interesting, however, is that the successful cases are marked by significant attempts to create a centralized medium for managing the distribution of decision-rights. This includes the creation of a coordinating body composed of users and technology providers as well as systems and processes for cross-business learning. For instance, 3M Co. has developed a scheme called the "core and channel systems" that ensures interoperability across the different business units and corporate functions as well as a streamlined process for integrating the technology plans of the businesses. Similarly, Aetna Life and Casualty is balancing a decentralization of its IT resources to the business units with a centralization of corporate-wide common systems and mission-critical applications.

Of late, there is a steady movement of many IS organizations along the vertical axis towards *outsourcing* (see Table 1). This is more pronounced in cases where the IS operations are relatively decoupled from the business operations and where there are strong financial reasons driving these decisions (such as: high cost of IS operations or low IS performance). Classic

examples reflecting this movement include: General Dynamics which signed a 10-year $3 billion outsourcing contract with CSC and Continental Bank which outsourced its IT operations to IBM's subsidiary, ISSC, whereby the head count of the IS organization changed from over 400 professionals to just over 20. Indeed, our ongoing monitoring of the outsourcing industry reveals that more than 10 contracts each worth over $500 million have been signed recently.

Table 1:
Key Trends in IT Outsourcing

Domain of IT Outsourcing	Companies@
Applications Development	33.5%
Data Center Management	9.1%
PC Procurement and Services	28.3%
Telecommunications and Network Management	19.2%
Systems Integration	16.1%

@ Percentage of companies which have signed a major outsourcing contract during the last three years in our sample of 159 Fortune 500 firms.
Source: MIT Study on IT Strategy

Where Should We be Positioned in the Framework for the Future?

The follow-up question that every CIO should ask is: "where should our IS organization be positioned in the *future* and why?"

This question is especially pertinent for a firm that is currently contemplating either an outsourcing arrangement or a streamlining of internal IS operations through a redefinition of decision rights. Here, the biggest misconception may be that insourcing and outsourcing are being viewed as alternative options rather than complementary options. One

senior IS manager remarked that: "what the current frenzy regarding IT outsourcing did for us was to force us to assess our internal IS operations and we figured that no external vendor could match our internal cost levels; so, we decided against outsourcing." Such an opinion, however, misses the point that the range of inter-organizational relationships is much broader and more comprehensive than outsourcing and that cost savings are simply one dimension of IT value that could be enhanced through such relationships.

Our research indicates that *insourcing* and *outsourcing* -- by themselves -- are not only limited in scope but also that they are not mutually exclusive. While insourcing fails to leverage the potential sources of IT competences through alliances and partnerships, outsourcing is accompanied by risks associated with managing the vendor relationship. Indeed, our study indicates that the major risks associated with outsourcing relate to the difficulty of reversing a long-term commitment enforced through contracts, loss of autonomy over decisions, excessive dependence, and possible breach of performance clauses in the contracts. Table 2 lists the benefits of outsourcing and risks of outsourcing (favoring insourcing) based on our research.

So, we advocate managers to consider moving along the diagonal by combining the "best of both worlds." It is entirely possible to adopt an insourcing mode for current IS operations while developing a set of inter-firm relationships with external partners for obtaining new IT-based competences for tomorrow. We believe that this position is what the logic of the new IS organization could be based upon.

Table 2:
Benefits and Risks of IT Outsourcing
(Ranked in Terms of Importance) @

Benefits of IT Outsourcing	Risks of IT Outsourcing (favoring Insourcing)
Access to technical expertise	Irreversibility
Increase in IT productivity	Biased portrayal by vendors
Positive impact on business performance	Loss of autonomy and control over decisions
Innovative use of IT functionality	Increased dependence
Focus on core business	Breach of contracts by the vendors

@ Ranks based on our sample of 159 Fortune 500 firms
Source: MIT Study on IT Strategy

At present, we have observed several organizations that have made significant strides towards reaching this target. These include, for example, Kodak that manages its IT competences through several well-publicized alliances: IBM for managing its data center and telecommunications network and JWP Information Services for its PC support services. In addition, it has a series of minor internal and external alliances and partnerships for creating IT-based competences to support and shape its corporate business strategies. In sum, the underlying rationale for this approach in managing the IS organization tends toward what we have termed as "a portfolio of relationships."

What Could the CIO Do?

1. Rethink the logic of the IS organization since the traditional wisdom based on the dominant goal of operational efficiency and consistency will be dysfunctional in the future. The challenge for the CIO is to make the IS organization behave more like a "business" unit that responds to the customer requirements and deliver the needed products and services by leveraging capabilities both inside the firm and through inter-organizational relationships.

2. Dispel the myth that outsourcing can "shift the burden to someone else." You can outsource the IS operations but you can never outsource the ultimate responsibility or the accountability. Someone in the organization that outsources is still finally responsible for delivering the required products and services on a continuous basis although the actual operations may be managed by someone outside the organization.

3. Sell the idea that the formation of inter-organizational relationships to obtain IT skills and capabilities does not imply that the internal IS organization is weak or ineffective. It simply indicates that the organization has *chosen* to leverage these relationships within a more efficient and effective strategy for obtaining these capabilities.

4. Create the mindset that the future IS organization is not a linear extrapolation of that in the past. Indeed, the management of tomorrow's IS organization is much more complex and challenging. It is not going to involve more of the same business routines and standard operating procedures, but it would encompass an entirely different set of repertoires and rationale. Managing a portfolio of relationships -- some

internal and some inter-firm -- is far different than managing a portfolio of technologies. The sooner this discontinuity is recognized and appreciated, the more successful the IS organization would be in playing its role for the late 1990s and beyond.

Sidebar#A:

The Four Dominant Positions in our Framework (see Figure 1)

Traditional IS Organization. This represents the typical IT function that develops the required IT skills and capabilities primarily through activities within the organization and manages the operations through decisions taken on a centralized basis. Vendors play a secondary role and decentralization of IS operations -- when existing -- is still tightly controlled through central decision-making authority. The dominant managerial focus is on the "management of technical portfolio." At present, most business organizations within Fortune 500 fit this category.

Insourcing. This represents the case where the IS organization obtains the required IT skills and capabilities through primarily sources inside the organization but has distributed the decision rights to the various responsibility centers (business units, functional areas etc.). We term this *insourcing* because the user units continue to rely internally for IS requirements, despite having the decision rights to source externally. Prominent examples include: Sears Roebuck Co. and Xerox Corp., both of which streamlined and reconfigured their internal IS operations with a dominant focus on distribution of decision rights to the different users.

Outsourcing. This represents the case where the IS organization has shifted the responsibility for deploying the required IT skills and capabilities to an external organization (IT vendor or systems integrator) with the consequent implications of concentrated decision-making by the external vendor. Prominent examples include: McDonnell Douglas' $3 billion deal with IBM's ISSC and Continental Airlines' $2.1 billion deal with EDS.

Emergent IS Organization. This represents the case where the IS organization seeks to exploit both dimensions of the framework to develop the required IT skills and capabilities through an inter-organizational network of relationships (both inside the focal firm as well as with outside organizations) and to manage the utilization of these competences through distributed decision-making processes. The dominant managerial focus in such a case is on the effective "management of relationship portfolio" involving an array of mechanisms such as: differentiated service level agreements with the users, technology licensing, minority equity investments, joint R&D, outsourcing, joint ventures etc. This is a moving target representing a stylized view; several organizations within Computerworld's Premier 100 do exhibit some of the dominant characteristics.

About the Researchers

Professor N. Venkatraman is Associate Professor of Management at the MIT Sloan School of Management. He received his Ph.D. from the University of Pittsburgh and his doctoral thesis was awarded the 1986 A.T. Kearney Award for Outstanding Research in General Management by the Academy of Management. His current research projects focus on the causes and effects of information technology (IT) governance, with particular emphases on IT sourcing. In addition, he has spearheaded a multi-year, multi-industry research project on electronic integration, namely: the use of IT functionality to restructure interorganizational business relationships. His research has appeared in *Academy of Management Journal, Academy of Management Review, Information Systems Research, Journal of Management Information Systems, Management Science, Sloan Management Review,* and *Strategic Management Journal.* He contributed an influential chapter on IT-enabled business reconfiguration for the MIT Research Program, Management in the 1990s, and has co-authored the lead-article for the 1993 Special Issue of the *IBM Systems Journal* on strategic alignment. His professional areas of research, teaching, and consulting intersect information technology and strategic management.

Dr. Lawrence Loh is presently conducting postdoctoral research at MIT Sloan School of Management. He recently completed a Ph.D. at Sloan, where he submitted a doctoral dissertation on the theme of information technology sourcing. His main research interests lie in the interface of management information systems and strategic management. His works have been published or forthcoming in academic journals such as *Management Science, Information Systems Research,* and *Journal of Management Information Systems.* He has also presented his research at several professional conferences including Academy of Management Annual Meetings and TIMS/ORSA Joint National Meeting. In June 1993, he will be returning to the Faculty of Business Administration at the National University of Singapore.