

The Changing Face of IT: Net-based Economics and the “New CIO”

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“By anyone’s standards, this is business played by a new set of rules.”
- Geoffrey Moore, Inside the Tornado.

Abstract: In 1981, a new executive title was introduced into business as a response to the ever-increasing need to effectively maintain the internal data infrastructure upon which corporations relied: chief information officer.¹ Nineteen years later, The Forrester Report declared “The Death of IT” in the face of external eBusiness systems and services - related in part to the inability of CIOs to respond to the dramatically changing business environment.² Our research addresses the “rise and fall” of the internal CIO role and proposes a new view of the Chief Information Officer, one which embraces the network-based (new) economy and the transformed business landscape, a “re-born” executive officer with a broader charter, a new set of requisite skills, and an ever-changing environment of systems, customers, partners, and knowledge methodologies that must not only be effectively maintained but creatively re-shaped, and reliably managed in real-time.

Introduction

Like canals and telephone systems in earlier decades, the Internet has introduced dramatic change into our business environment.³ Among the many changes that we continue to experience are changes to our management methods and roles, both within and between corporations. This document reviews current literature regarding the role of IT organizations and the CIOs who lead them, and proposes a new emphasis on business relationships and knowledge management as core elements of a transformed CIO role in our institutions.

This “New CIO” is a partner in a networked community of senior IT managers to deliver systems and services with a greater sensibility for data about customers, vendors, and partners – it is a matrixed role in a “network of associations” for which some are suited, and others are not.

¹ Carol Brown, Graduate School of Business, Indiana University; “The Successful CIO: Integrating Organizational and Individual Perspectives,” 1993. P. 400.

² B. Cameron, “The Death of IT,” Forrester Report, January 2000.

³ Tom Peters, Liberation Management, p. 110. “Nothing has been of greater historical importance to relative economic development in the U.S. and elsewhere than the growth of networks: canals, railroads, highways, phones.”

I. The Forrester Oversight, and Other IT Myths Exposed

It is not, as the authors of Forrester's "The Death of IT" have proposed, the end of the world for IT professionals.

The authors of the aforementioned Forrester Report overlooked the central qualities common to every successful IT organization, and every successful IT manager, during the past twenty years: an ability to comprehend the impact of new technologies on their businesses, and their ability to adjust their policies and environments in response to those technologies.⁴

Turbulence continues to be the primary element that challenges IT management.⁵ The capacity to understand and manage turbulence continues to be the primary success metric for CIOs, and the organizations they manage. The introduction of countless Application Service Providers (ASPs) is not a threat to them – it is merely the latest technology wave they must understand, and address. Successful IT organizations will continue to be successful as their companies move to, and thrive in, a network-based economy, because they have already mastered the requisite skills for success in that environment.

What the authors of the Forrester Report accurately forecast are the risks facing those struggling IT organizations (in every vertical market and in every discipline). These organizations cannot adjust easily or swiftly to marketplace changes. They remain "married" to old technologies (boxes, switches, engines, code) because that is where their expertise exists. They resist the rapid adjustments and paradoxes that are inherent in our international economy. These organizations will fail exponentially as the pace of change accelerates, and the requirements of a network-based economy overwhelm old-style, hierarchical management models.

The essential challenges are not new to CIOs. Those that have been successful will continue to be successful, and those who have struggled with new concepts, new methodologies, or new technologies will now fail even more dramatically than before.

During the course of our research for this paper,⁶ we spoke with CIOs and senior IT managers in a variety of businesses and disciplines. In each case, these IT leaders identified previous periods in their careers when the existing systems of their companies could not respond to the sudden introduction of new requirements for information, reliability, and efficiency of cost. And each one identified the crises that have occurred when IT became the reason, perceived or real, for a company's failure. The demand for data has always been greater than IT's capacity to deliver it. Resources have always been

⁴ B. Cameron, "The Death of IT," The Forrester Report, January 2000. "Separated from business process teams and isolated from external constituents and technology sources, the IT organization as we know it will die." <http://www.forrester.com/ER/Research/Report/0,1338,8872,FF.html>

⁵ For a broad discussion of the role turbulence plays in the management of information systems, please refer to the author's article entitled, "The System is a Mirror: Turbulence and Information Technology," copyright 1995, Association for Computing Machinery, SIG-DOC Conference Proceedings.

⁶ For a list of individuals and brief biographical notes, please see Appendix A.

less than adequate. The need for better information about the customer and the market has always been greater than the ability of IT to report it. And the requirement for machines and networks to operate faster and more efficiently has existed since IBM punchcard systems and Cray servers were first brought online.

The Forrester demon, an “exT” system/service, and what that dynamic exoskeleton requires of IT managers, is a challenge born not of the technology itself, but of the network-based economy in which it operates. That net-based economy requires a far greater interaction with each user, a far more intimate relationship with individual customers, and a far more sophisticated communications protocol (not only at the level of TCP/IP, but between the human beings that are interacting via that protocol).

IT professionals must now know more about each customer than we needed to know before. That knowledge must be immediately available – to management, to a remote sales force, to the manufacturing facility, to the factory, and indeed to the customers themselves. It is required because IT organizations are now interacting with each customer “real-time” (in the present tense) and delivering the service/product 24 hours each day, seven days a week, 365 days a year. IT organizations, and the CIOs that lead them, are the central facilitators of each relationship upon which our business success relies.

In fact, it is not the availability of external systems and services that is presenting a challenge to “old school” CIOs. The nature of the new economy has already transformed the successful CIOs into central decision-makers that are critical to the viability of the company, fundamental members of the core executive team. To those CIOs, the “externalization” of certain systems and services are simply another tool at their disposal, to be evaluated on a case-by-case basis in terms of the problems solved and the cost of solving them, another option available to them in an already-complex, matrix-oriented business that is in constant flux.

What is new about today’s “externalized infrastructure” paradigm?

The Internet has eliminated many of the bottlenecks that IT organizations have been struggling to overcome. Certain graceful applications and services are now a default, a given in every internal customer’s expectations. As the expectations for availability and reliability of systems and information increase, so increases the IT manager’s need to deliver with a) less than the necessary resources, b) teams that may not have the right skills, and c) a management structure that may not be mature enough to manage those new expectations in the context of “Internet speed.”

Before examining the challenges to CIOs posed by external business services, we must first understand the role itself, and the turbulence that is faced by each CIO every day.

II. The Changing Role of the CIO

The evolving role of the new CIO is being reported in many arenas. A recent survey by Egon Zehnder International, an executive search firm specializing in CIO placement,

determined that companies are increasingly looking to a new generation of chief information officers to be business strategists. They found that these “new CIOs” spend at least half of their time outside the IT department, focusing on external eBusiness relationships. CIOs are being recruited to help define all aspects of the company’s business, including much more time with partners and customers.⁷ A recent edition of Computerworld dedicated to identifying the premier 100 IT leaders and the changes they are facing amidst the surge of eBusiness challenges notes that CIOs have become business strategists. More and more, CIOs are the executives who “see the possibilities,” forging alliances and ensuring alignment with critical owners of business relationships, both within and outside the corporate boundary.⁸

Subsequently, standard IT “best practices” and management principles, once the key to success for internally-focused CIOs, are being supplemented by an additional set of values and requisite skills. The new CIO must be an entrepreneur, a matrix manager of teams that do not report into IT and may not even belong to the company, an architect and eBusiness visionary, an evangelist, a relentless recruiter, a mentor, and an expert in the psychology as well as the implementation of (constant) change management.

The capacity of the successful CIO to serve as both visionary and customer advocate, someone who is both a consumer and a supplier of services, is directly proportional to that CIOs ability to migrate to an externalized system of services and foundational infrastructure. That CIO must have the ability to comprehend, and then teach, the essential importance of intellectual property that resides on a corporate intranet, even if that intranet exists on another company’s servers and is maintained by another company’s employees.

Successful CIOs must be able to transform the old theories of “federal versus state” funding of projects (the politics of centralized versus de-centralized control that erupts annually in budget cycles that often require months to resolve) to embrace the latest variation of that analogy: the “global versus personal” requirements of net-based messaging and information delivery. They must now deliver core internationalized architectures that can be translated into dozens of languages, yet offer individual views of information that are unique to each business role.

Struggling CIOs will continue to be distressed about who is paying for what, and why 80% of what is being asked is simply impossible.

Forward-thinking CIOs will initiate conversations in their companies about how they must architect their products and services to serve a multi-cultural, multi-lingual Internet community on desktops that are unique for each user.

The changes in the role are pervasive, and well-documented. As early as June 1999, the executive search firm of Korn/Ferry, in association with the Financial Times, completed a survey of 340 CIOs in the United States, the United Kingdom, Germany and France. The

⁷ “Internet Brings RESPECT...,” San Francisco Chronicle, May 15, 2000.

⁸ “CIOs Morph into Business Strategists,” Computerworld, May 8, 2000.

goal was to “produce an accurate and detail picture of the changing role of the CIO and the IT function” in those countries.⁹ The basic conclusions are not a surprise, but are worthy of attention because they underscore that it is not a single technology, or specific series of initiatives, causing the change. Rather, it is the overall business environment of our companies in response to a broad and diverse set of factors. In addition, the Korn/Ferry study found:

- The CIO role is shifting from operations and implementation to the arena of strategic planning, from data processing to the broadly defined arena of Knowledge Management.
- Harnessing corporate knowledge “may be the corporations most pressing challenge and at the very heart” of the CIOs evolving role.¹⁰
- There continues to be a high degree of ambivalence among today’s CIOs about the changing nature of their jobs, and the new roles and new skills that are required on a daily basis
- Almost every CIO noted that “local firefighting” continues to prevent them from adjusting to the more strategic role, even when they are so inclined to embrace it.
- Companies that can successfully manage the transition of the CIO from an information processing function to a knowledge management role will have an enormous competitive advantage over those that do not understand and adapt to the demands of this changing business world.

III. Business Relationships and Knowledge Management are now Mission Critical

As systems are outsourced and the infrastructure and service levels are replaced by specialized vendors, the critical component of a corporations’ intellectual capital - the knowledge being transmitted via those systems - becomes a primary mission of the new CIO. Once a peripheral “nice to have” project, the dynamic management of the corporate data model, and all information objects contained in and defined by that model, become the domain of the CIO to design, implement, and promote.

When they have captured their organization’s intellectual property, and discovered how to successfully deploy that knowledge across the enterprise, CIOs have an additional challenge: integrating that knowledge with information from and about customers, who are also suppliers and partners on the Internet.

As Doug Kalish, the CKO of Scient states, “Effective knowledge management requires a unified, organized approach that traverses the enterprise and transcends departmental boundaries.”¹¹

Knowledge management must ensure the security and availability of intellectual assets to the corporation, without which the corporation will be unable to leverage its work, or its workers. If traditional IT organizations remain internally focused (thereby operating in a

⁹ “The Changing Role of the CIO,” CIO Magazine, June 1999.

¹⁰ Ibid.

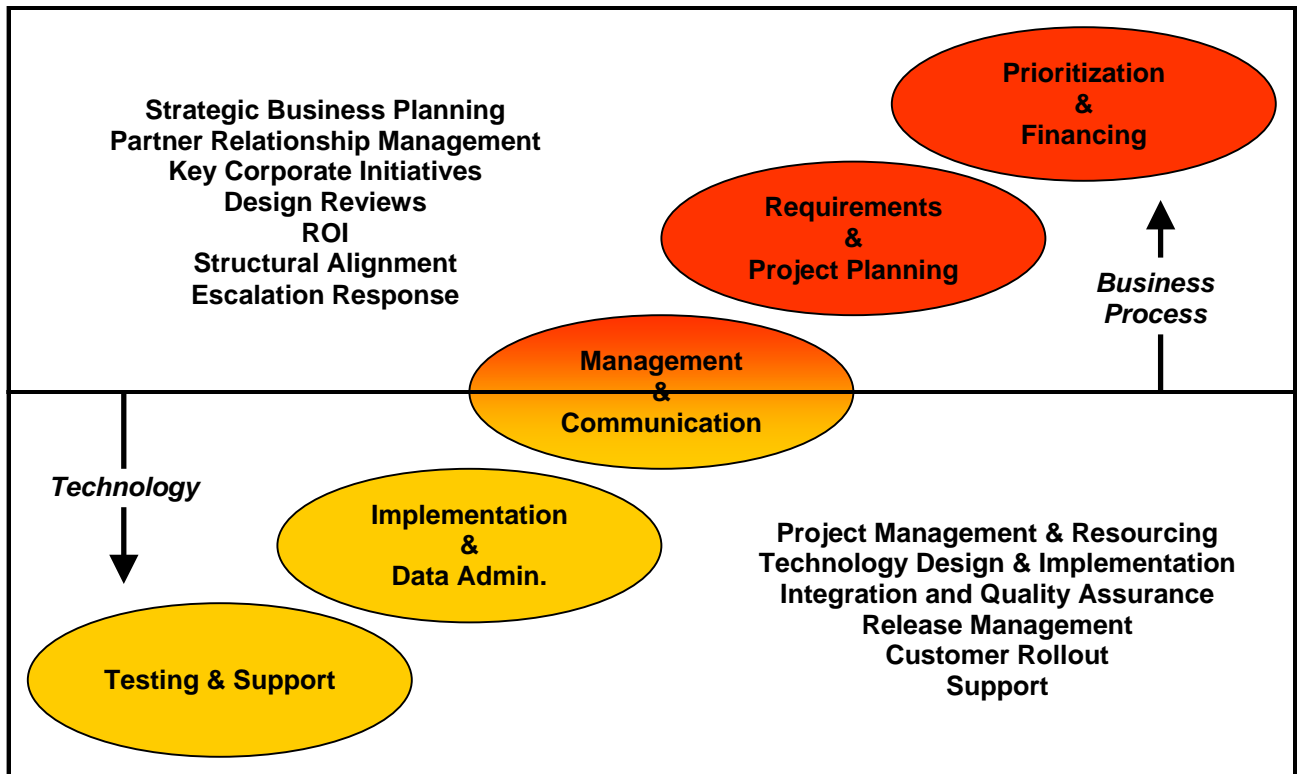
¹¹ “Knowledge Management Across the Enterprise,” 1999.

vacuum that is absent of reliable external data) then, indeed, the chasm between those organizations and the “e-world” beyond its corporate boundaries appears unbridgeable, or as the Forrester Report declares, a “no man’s land” without data or connectivity or relationships.

Business information management becomes the lynchpin of “e-success” and a key role that enables that success is the role of the business process analyst. The analyst is thoroughly familiar with current technology. The analyst is also immersed in the user’s methods and needs, able to provide the bi-directional communication necessary to ensure that new tools meet the user’s expectations and requirements.

During our interviews, another common theme echoed by many of the CIOs and IT Leaders was the critical need for IT focus upon those business processes; as a consequence of netsourced services and infrastructure, I propose that the fundamental focus of senior IT professionals within our corporations will be enabled to shift from “below the line” firefighting and implementation issues to “above the line” process issues that are critical to the success of eBusiness initiatives.

Diagram 1: “Above the Line and Below the Line”



In the language of Diagram 1, all “firefighting” and basic maintenance IT functions are considered “below the line.” In many companies today, the primary “above the line”

functions of IT Business Process Management are frequently overshadowed by the time constraints and constant problems of “below the line” Technology Management. For the purposes of this discussion, I will refer to those business processes as “above the line” job responsibilities. The basic IT functions (which, in many cases, can be outsourced) are referred to as “below the line” responsibilities.¹²

To best understand the potential value of externalized business systems, one must understand the shift that will occur when the “below the line” responsibilities are shifted to 3rd parties (who are responsible for external hardware, software, and first/second level support of those systems).

In that scenario, senior IT personnel at every level of the hierarchy (executives, managers, subject matter experts, business analysts) will have the time and capacity to a) interact more frequently with the business process owners within their corporations, b) provide more consistent “bi-directional” communication between the process owners and the external partners who are now responsible for the systems, and c) influence the critical changes in corporate business processes that must be enforced if eBusiness initiatives can be given an opportunity to succeed. It is not that outsourced systems will eliminate the need for internal IT staff – on the contrary, IT staff become more critical as they are allowed to focus on the key business processes that are enabled by technology.

The key factor in the ongoing success of IT organizations and the management teams that lead them is the ability of IT to focus on business processes, and enable the business transformation that is needed in an eBusiness environment.

Viewed from this perspective, the existence of externalized business systems and services can be seen as enablers which, if given the *proper management structure*, will nurture change in our corporations. That increased importance of business process management is thus viewed as mission-critical to our companies, and to the growth and enrichment of our economy.

Finally, the role of the CIO itself can and should be influenced by this shift: each corporate CIO (whether as a permanent function or an advisory one in emerging businesses) becomes the “business process analyst” for the entire institution, interacting with the customers of the enterprise in the same manner as the internal business analyst successfully interacts with internal business users. The model is known to every experienced CIO – it must simply be extended beyond the boundaries of the corporation.

IV. Some Things Remain the Same...

It is certainly true, as Geoffrey Moore indicates in his new book, Living on the Fault Line, that there are entirely new management paradigms that are required for companies to keep pace. It is particularly encouraging that he emphasizes the need to gain maximum leverage in an environment of resource scarcity by concentrating upon a

¹² First identified for the author by Jim Cates, then CIO of Synopsys Corporation in 1997.

company's core activities, while outsourcing everything else.¹³ In this way, corporations will be able to encourage innovation with the speed and flexibility that the net-based economy requires.

It is important to note, however, that even in this world of velocity, some of IT's basic truths must still be reinforced for eBusiness to thrive:

1. Requirements must still be defined before system implementation can begin. Clear requirements definitions are the foundation of service level agreements, and service level agreements are at the core of successful outsourced/netsourced models.
2. Moving at Internet speed is not an excuse for bad design or sloppy coordination between teams. Solid project planning is still the hallmark of success. Whether you have six hours of planning in a project schedule of three days, or six days of planning in a project of six weeks, the ultimate deliverable (on time, according to specification) remains directly dependent upon the level of planning before the work begins.
3. A failure caused by inadequate testing (in other words, a problem discovered by the customers first) is a failure of engineering and a failure of management. Quality models still apply to net-based software development, whether that development is offshore or object-oriented or integrated with 3rd party products, quality must be designed into the production process early, and everything must be thoroughly tested before it is placed into production.
4. Communication, communication, communication. Every IT professional knows that most implementations, from the smallest shell script to the broadest ERP implementation, fail 5% of the time because of the technology and 95% of the time because of the people who, at critical junctures in the project, were unable to communicate key issues.¹⁴ The essential ingredient of managing relationships is communication – from listening, through critical thinking, to clear response. (As with layered applications, in which rigorous APIs clearly control and ensure the interaction of the layers, it is the same with layered organizations, in which “communication APIs” must be clearly delineated and rigorously observed.)¹⁵

For these values to be reinforced, the personality of the institution, the corporate culture, becomes more important as organizations move more quickly.

Velocity requires a cultural foundation. For collaborative tools and networked organizations to succeed, the management teams must make explicit efforts to market the company vision and meet essential milestones in its delivery. They must also actively

¹³ Geoff Moore, *Living on the Fault Line*. HarperBusiness Books, June 1, 2000.

¹⁴ The most heart-rending example of this failure to communicate is the inability of engineering to clearly report their findings in the weeks preceding the Space Shuttle disaster in the 1980s. The O ring failures were known and documented, but the decision-makers were unable to comprehend what they were being told.

¹⁵ These “Communication APIs” are protocols that must exist within and between departments of one company, as well as between partnered organizations in a matrixed governance structure.

facilitate and nurture, as one would concentrate upon soil and irrigation in an agricultural business, the community from which those deliverables are spawned.

Again, Geoffrey Moore¹⁶:

In my latest book, Living on the Fault Line, the last chapter, entitled "Building to Last," is focused on the importance of declaring a culture as a management imperative in order to enable large organizations to make swift adaptations to change. Start-up entrepreneurial organizations can succeed in the short term without taking this step formally because they are small enough to act as one (and often have a clear, if undeclared, culture). The key long-term lesson, however, is that in any conflict between strategy and culture, culture wins. If culture is left undeclared and unmanaged, strategy is perpetually at risk.

As a corollary, in technology organizations with networked infrastructures and customer systems to be linked, the absence of that community can be traced to the absence of a vital CIO/CTO/CKO presence at the executive and inter-customer level. The naturally cross-functional nature of the CIO role, bridging disciplines and customer/partner relationships, creates an organizing principle around which such "communitas" can be established. In those IT organizations, one of the first steps in solidly implementing the requisite culture identified by Geoffrey Moore is to seek a definition for and then establish the central offices of the "New CIO" in which that CIO is chartered to manage and foster the business relationships of the corporation.

V. Creating an IT Collective

Business today is mid-cycle in a transition away from purely physical (brick and mortar) businesses. These businesses were organized hierarchically and functioned successfully in a model wherein decisions were made "at the top" and implemented by "lower ranking" teams or individuals. The economy is moving toward networked businesses based upon matrixed or self-organizing organizations and partnered arrangements between numerous suppliers, all of whom work together to accomplish the delivery of a particular product or service. These networked businesses are essentially interdisciplinary in composition and their decision-making models are based less upon what one's boss thinks should be done and more upon what the "networks of association" require at any given point in time.

Certainly, networked organizations are not new.

What is new, and compelling, is that the technology and economy have moved toward a nexus of common interests. The technology, not only the Internet but the complex hegemony of externalized structures upon which corporations now depend and where their primary intellectual capital resides, has expanded exponentially in the past five years and promises to expand again, exponentially, in the coming five. It is a technology designed for and driven by the requirements of networked organizational delivery of

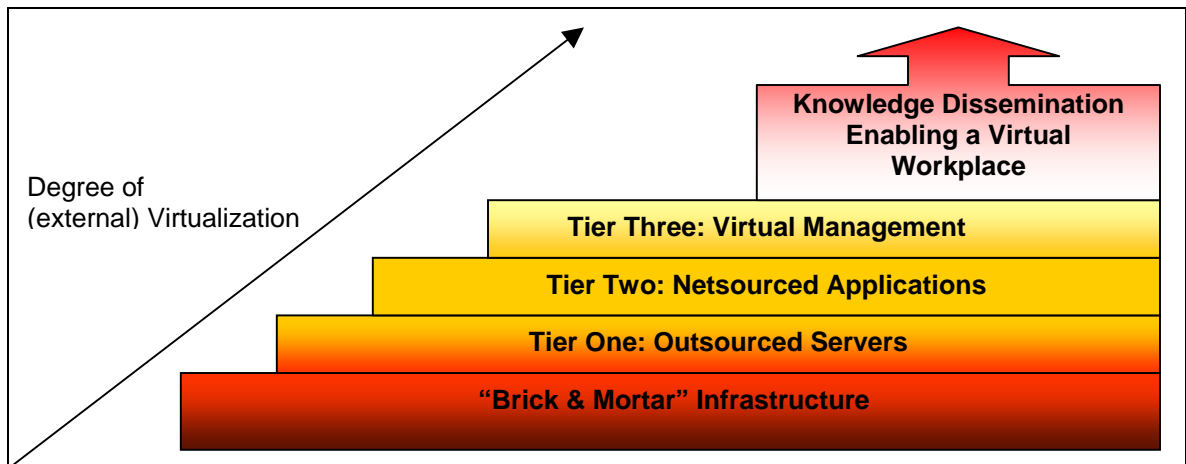
¹⁶ Correspondence with the author, May 19, 2000.

service. There are now some very sophisticated switches and languages that are enabling the net-based interoperability and ubiquity that fuel a networked approach.

The economy, too, seems to be transforming itself from 18th century cost of goods and manufacturing finesse to 20th century information-based value, with new products and services being announced daily (hourly) that are designed to enhance the intelligence of our lives – computerized homes and clothing, wireless data access, real-time and just-in-time interactions in a marketplace that exists exclusively within devices. As with the advent of previous networked phenomena (canals, phones), some methods of market value may disappear while others that do not exist today may tomorrow become requisite pieces of our domestic landscape.

Recent developments in externalized business structures serve both as a symbol of and a catalyst for the information economy. A very simplistic view of those structures can be seen in Diagram 2, wherein the first tier of externalized systems – the hardware on which are data resides and our within/between which our software operates – can be represented by companies such as Exodus Communications and USInternetworking, among others.¹⁷ No one believed that it was sensible to “give away your mission-critical hardware” five or six years ago, and yet, today, it is the default option for most new corporate architectures.

Diagram 2: Stages in the Evolution of the Virtual Organization (Workplace)



The second tier of externalized systems (what the Forrester Report calls an eXT) can be represented by companies such as Corio, Loudcloud, Jamcracker, Agilion, iPlanet et.al., through which most of an institutions automated systems – not only their email and basic security functions, but even the critical financial systems upon which a CFO relies can be

¹⁷ I was managing a team that was an “early adopter” of Exodus hardware and I can attest to the complete disbelief expressed at executive levels of our company when we dared to suggest that we were going to place a critical production-level server (with which we would be delivering our software directly to customers) outside our own company’s geographical boundary – even outside of the company’s initial firewall itself, and have it be housed at Exodus.

hosted, managed, and supported by a company other than the one using those automated systems. With this second tier, business applications that have become so critical to businesses being transformed to thrive in a net-based economy, is the next stage of virtualization – the dislocation of physical boundaries of an institution or initiative in which the capacity of the individuals is enabled by networked servers, software, and support teams that exist around the world and work for many different customers and bosses, but at any given point in time, are working exclusively for you.

The stabilization of the Tier One and Tier Two levels of virtualization (hardware and applications) introduces the viability of Tier Three. Tier Three cannot exist without the pre-requisite foundations of the first two tiers, though it can be conceptually understood and frequently prototyped, it cannot be enabled until the dislocation of physical boundaries has been adopted by the majority of functionaries on any given supply chain. When the majority of functionaries on that supply chain are enabled by a network that satisfies the basic performance and reliability requirements, the third tier – virtual organizations and knowledge management – becomes not only a possibility, but a vital next step in the evolution of the virtual workplace.

It is the virtual workplace – the encompassing capacity of distributed labor to successfully design, build, produce, and market both products and services – which begins to solve many of the current inhibitors to productivity within walls: time constraints, staffing shortages, discrimination (all types), etc.

However, the challenges facing Tier Three initiatives are daunting, compared to the relatively simple notions of outsourced hardware and data-processing applications. Perhaps the greatest challenge is the absence of sophisticated management to successfully oversee an entirely matrixed community of products/services.

The proposal: to create, and then augment, the IT management community by creating adhoc consortia of senior IT managers from every geography and each major business vertical who interact as business analysts between their primary institutions, and who share knowledge across the boundaries of their primary (core) business.

In this way, IT management philosophy will mirror its application recommendation for customers: networked solutions are optimal in the new economy, and therefore, old management hierarchies can no longer respond to the need for information and flexibility. By creating a networked organization of senior IT professionals and supporting that network with an ever-expanding database of specific, executive-level information that can be shared, net-based businesses will be living the methodology. In short, we should be managing our systems with models that mirror the systems themselves.

CIOs must become the role models for networked IT management. If we are to do so successfully, we must create that network and give it the tools that it needs to thrive in our net-based economy.

The primary challenge will be the trust and cooperation required at every level of the CIO collective, to ensure that it incorporates the principles that are requisite to that economy – those principles of trust and cooperation (embodied by the autonomy of the individual CIOs and the shared information that links them) are the key ingredients that will serve as catalysts for the collective itself.

Trust and cooperation, catalysts for the collected communities, are the cornerstones of a culture that must be reinforced in every management methodology, every memorandum and keynote speech, and must be modeled in the behavior of each management interaction in order that they can be institutionalized.

They are the cornerstones of shared knowledge, of distributed authority, and of those “network of associations” upon which this new economy can be sustained.

It is not, therefore, the existence of ASPs or the outsourcing of our mission-critical systems that threaten IT organizations. It is, rather, the requirement of trusted communication and cooperation in a competitive business environment, the necessity of open access to business intelligence that can be leveraged across corporate boundaries – these become the greatest challenge facing IT organizations and IT leadership in a net-based economy. Success will come to those CIOs who can change themselves, and their organizations, to embrace these requirements as essential components of their profession.

Appendix A: : With grateful acknowledgement to those who have taken the time to respond to my questions, in their offices and via email:

- Ken Kay, CEO and Founder, InfoTech Strategies, Washington, D.C.
- Doug Kalish, CKO, Scient Corporation, San Francisco, CA.
- Bill Seltzer, SVP and CIO, Office Depot Corporation, Del Ray Beach, FLA.
- Paul LaValley, Director of IT, E.piphany, San Mateo, CA
- Jim Ford, Director of Network Applications, Tree of Life Foods, St. Augustine, FLA
- Krimo Salem, Founder, If-Then Inc., Sunnyvale, CA
- Jim Spitze, Systems Consulting Consortium, Orinda, CA
- Nathan Fierman, CIO, Documentum, Inc., Pleasanton, CA
- Joe Riera, CIO, JDS Uniphase, San Jose, CA
- Reza Sadeghian, CIO, Veritas Corporation, Mountain View, CA
- Steve O'Connor, CIO and VP of WorldWide Consulting, SGI, Mountain View, CA
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