



AN ARTICLE FROM  
**CSC**  
WORLD

THE FUTURE OF ENTERPRISE IT: PERVASIVE,  
CO-EVOLVING, CONSUMERIZED



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- Retail

- Travel & Transportation

- Infrastructure
- Development
- Maintenance
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- BPO



Emergence  
Relationship  
Clients

- non service delivery oriented
- provider
- partner

Co-Evolving

Enterprise IT

Consumerized

- pre-eminence
- Innovation
- Consumer driven
- Cloud

by David Moschella

LEADING EDGE FORUM

# THE FUTURE OF ENTERPRISE IT

**PERVASIVE ■ CO-EVOLVING ■ CONSUMERIZED**

In this special 50th anniversary edition of *CSC World*, we look forward and backward at the evolving world of Enterprise IT. While one might think a topic more than a half a century old would be well into its maturity, advances in information technology continue to reshape and often disrupt our markets, our organizations and increasingly, the way we work, live and learn. If anything, the pace of change is accelerating.

To help our clients meet their ongoing need for new IT strategies and management practices, we offer a rich heritage of cutting-edge research at the intersection of business and IT. Such research is particularly useful in today's highly uncertain climate. It is all too easy to be overloaded with information, much of which is available over the Internet. What business leaders really need are proven ideas, concepts, frameworks and case studies that clarify understanding and sharpen decision making. By focusing on advanced and emerging business/IT operating models, CSC's Leading Edge Forum (LEF) helps leaders see through the market's turbulence and develop forward-thinking strategies.

Our views are based on a solid foundation of research methods and processes. CSC has a long history of working with leading academics and other thinkers at the forefront of their fields. We balance this theoretical work with client case studies and focus groups that uncover practical issues, concerns and priorities. These two ends of the spectrum are then made whole by our senior LEF researchers, all of whom are experts in their fields and leading thinkers in their own right. The resulting scenarios and frameworks have consistently proven to be both theoretically sound and applicable to real-world market conditions.



as marketing, purchasing, finance and human resources. These units tend to have more widely agreed-upon structures, missions and governance. Organizations don't tend to debate nearly as long or hard about their purpose, value or alignment as they do with IT.

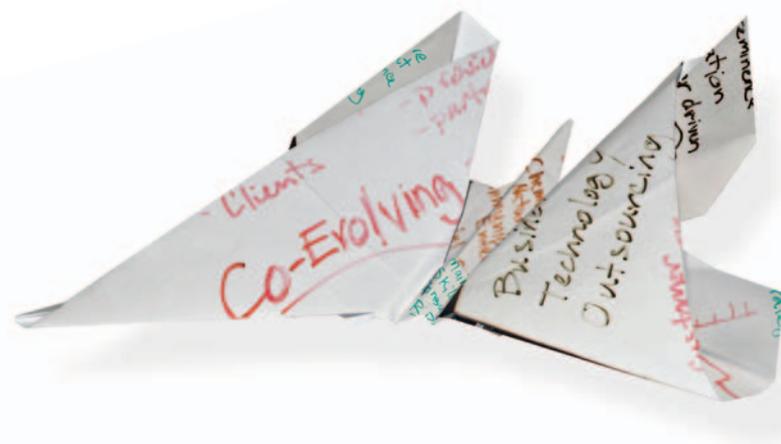
Today, the scope of modern Enterprise IT usage typically comprises a complex information-based replica of the firm. Indeed, in many organizations, this virtual, information flow-based view is either indistinguishable from or even more "real" than the actual physical organizational structure, which is often based on increasingly irrelevant buildings, time zones and geographies. In many ways, the virtual is becoming the real.

### Business and IT co-evolving

Figure 1 uses conventional Venn diagrams to put the evolution of the Enterprise IT function into a historical context. Although these simple images obviously condense a great deal of IT history, we think they provide a useful perspective on the enormous changes we have already experienced. We see three main relationships, equally applicable to both business and government IT:

- In the 1960s, 70s and early 80s, IT accounted for only a small share of business/government spending, operating largely as an adjunct to most firms and agencies. Business and IT were quite distinct professions that often had difficulty communicating. Upper management generally had to be sold on the necessity of IT, being primarily concerned with getting an acceptable return on investment and keeping IT activities reasonably aligned with the business. Central IT managed nearly all IT activity.
- With the rise of the first personal computer, and then the Internet, technology spread out across the enterprise rapidly and enabled important new ways of doing business. During the dot-com boom of 1994-2001, IT began to be used much more directly for sales, marketing, customer service and other core business functions, and thus could no longer be avoided by non-IT management. The result was a period of overlapping and often conflicting business/IT management paradigms, and a general weakening of central IT control.
- Today, as computer networks and information flows define most business activity, a period of business/IT *co-evolution* has emerged. Business and IT change are now recognized as largely inseparable, and the successful organization must develop integrated business and technology management processes. Increasingly, the Internet is becoming the backbone of both the global economy and the individual firm. Central IT must provide the architectural, governance and services capabilities needed to leverage IT's potential, while sustaining enterprise agility.

We believe co-evolution is the best term for describing the current dynamic between large organizations and IT. Mechanical metaphors such as "IT drives business change" do not capture the complex interplay between business and IT capabilities. Indeed, the line



between business and IT is not just blurring, it is vanishing, as a new generation of *double-deep* employees (skilled in both their profession and the related IT) increasingly see their work in information processing terms.

### Moving from provider to partner

We have been using the figure below for many years. It reflects the fact that our CIO clients regularly tell us they see themselves as being on a journey, as they try to move beyond just providing or promoting technology within their organizations. They increasingly seek to be fully integrated with (and sometimes actually leading) the business-change agenda, even if relatively few CIOs and IT departments become true strategic peers.

But while Figure 2 may suggest a smooth, upward progression, reality is much more challenging. Put simply, the skills, behaviors, attitudes and objectives for the provider/promoter roles are nearly the opposite of those required for partner/peer relationships. Thus, moving up the IT value chain requires serious cultural change. IT professionals accustomed to talking about systems, projects, procedures, SLAs, requirements, security and so on are often less effective in translating these technology discussions into real business issues such as customer value, time to market, innovation, collaboration and globalization. Similarly, many IT

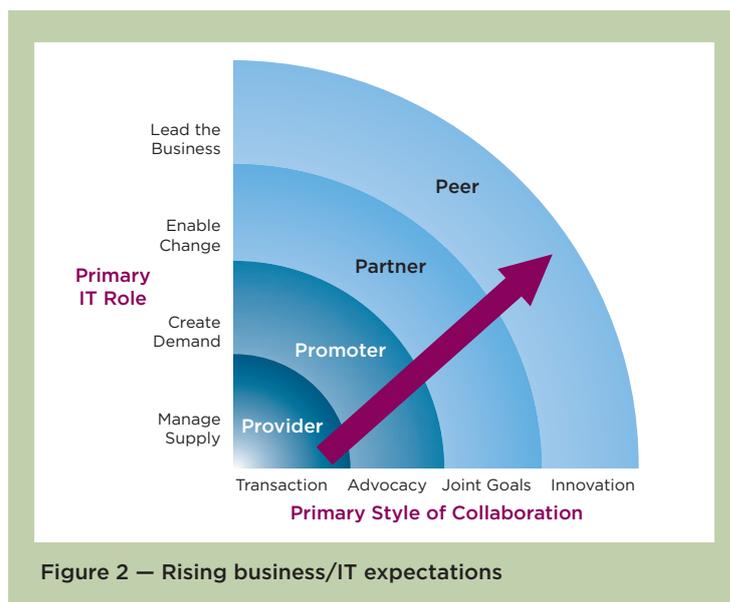


Figure 2 — Rising business/IT expectations

professionals lack the requisite communications, negotiation and other soft skills required for these new roles.

Thus, Enterprise IT leaders face the difficult question of whether their teams can maintain the necessary technical and business skills to be both *providers and partners*, or whether they should step back from one role so they can properly focus on the other. This can be a tough and emotional decision, not just for IT staff but for CIOs themselves. This is why the topic of Business Relationship Management, while certainly not new, remains a major area of our research, especially in IT-intensive realms such as marketing, supply chain, customer service and embedded Product IT.

Looking ahead, it seems clear both business priorities and the mission of Enterprise IT will migrate steadily toward the right side of the diagram in Figure 2, where business and technology change are largely synonymous. It is this reality that explains why CSC has made expanding its industry-specific offerings such a high priority. As the marketplace shifts, responsive suppliers must move accordingly.

From a top-level governance perspective, every firm needs to think through how resources and responsibilities will be allocated

and organized to address this increasingly pervasive and complex IT environment. There is clearly a great deal of work to be done, and a wide variety of viable options. Figure 3 is another simple picture that masks a great deal of underlying complexity. From this high-level vantage, we can describe and assess the principal sourcing alternatives to Central IT.

**Business units.** Many executives instinctively feel major business divisions, departments and other entities should be responsible for their own IT, at least at an applications level. Yet there are obvious trade-offs between efficiency and effectiveness, as firms decide what level of centralization/decentralization makes sense for them. There is no single, or even dominant, answer. But it appears strategic applications will increasingly reside in the business, while many other services will be delivered through a shared services organization.

**Partners.** In recent years, the range of IT professional services options has expanded significantly. In addition to established global players such as CSC, we have seen the rise of a number of offshore providers. Additionally, although less visibly, there is a wide range of both vertical (insurance, retail, health, etc.) and

# RECESSIONS, RENEWAL AND THE SEARCH FOR SILVER LININGS

Recession. Depression. The words themselves can bring you down, and sometimes become self-fulfilling. Perhaps you might find it more comforting to view the current market turmoil as part of an ongoing process that the great Austrian economist Joseph Schumpeter labeled creative destruction. Maybe merciless recessions really are needed to burn off excess market underbrush and clear the way for new fields of growth. Fifty years from now, we might look back and see today's crises as the beginnings of a new economy, one less dependent upon financial services, housing, oil and automobiles. Maybe.

The history of the IT business tends to confirm this close relationship between recessions and renewal. In the second half of the 1980s, a prolonged U.S. economic slowdown helped sweep away the proprietary minicomputer industry, as lower-cost personal computers provided a much more cost-effective Enterprise IT alternative. Within a few years, one-time high flyers such as Wang Laboratories, Digital Equipment Corporation, Data General and Prime Computer were all gone, replaced by even higher-flying giants

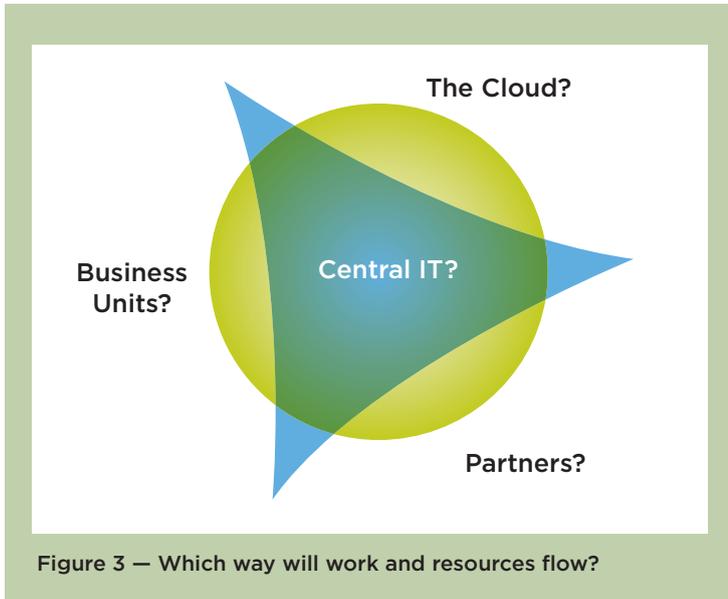
such as Microsoft, Intel, Cisco and many others.

Similarly, in 2001, when the dot-com bubble burst, hundreds of Internet startups quickly vanished. But those that survived, especially Google, Amazon and eBay, emerged as a new generation of IT industry leaders capable of pushing consumer technology forward in what soon became known as the Web 2.0 movement. It took us a while to learn that the Internet was not just about building companies, but about empowering customers, as we have seen with MySpace, Facebook, YouTube and no doubt many others to come.

Will the current downturn reveal a similar silver lining? We see two areas where it might. Just as PCs provided an alternative to proprietary minicomputer systems, so could the cloud computing movement expose the high cost of enterprise computing infrastructures and their associated proprietary software. The combination of Internet-based computing and open-source software has the potential to radically alter IT industry economics. Steep recessions give us all a good reason to take a closer look.

A second, less obvious scenario involves business/IT complexity. While it's easy to blame financiers and homebuyers for the economic meltdown, the IT industry is complicit in its own way. Complex derivatives, mortgage-backed securities, credit default swaps and the like wouldn't be nearly so complex without the computers, software and the *rocket scientists* behind them. The result has been financial transactions and interdependencies often too complex for the human mind to unravel, greatly increasing the overall level of uncertainty and fear. It's been a humbling lesson.

This sort of co-evolving business/IT complexity and dependency is much more pervasive in our society than most of us like to acknowledge, and will only become more so over time. The challenge for our industry, and especially for Enterprise IT, is to embrace the upside of computer-based automation, modeling and analysis, while retaining sufficient humility regarding the risks and limits of such systems. Much of the 21st century economy will hinge on our ability to make IT work for us, not the other way around.



horizontal (logistics, marketing, accounting, etc.) business service providers who specialize in double-deep business/IT capabilities within their targeted sectors. There is now little most firms do that could not be sourced from an outside supplier, and the vast majority of our clients believe the role of partners will increase significantly over time.

**The “cloud.”** Perhaps most intriguingly, companies, business units and individual employees can now do an ever-expanding range of work directly over the Internet. From a long-term IT strategy perspective, there is probably no greater question than the eventual relationship between the traditional private infrastructure used by most large enterprises, and the increasingly capable services available directly over the Web. This is a major area of our research, and, as we will explain, the differences between what is increasingly known as *cloud computing* and what we have long referred to as *consumerization* are not significant in this context.

Having discussed these various computing alternatives at great length with our clients, we think some distinct patterns are emerging. In recent years, the concept of shared services has grown in popularity for IT infrastructure, HR, purchasing, security and other areas. At the same time, Central IT is expanding its commitment to architecture, governance and the sharing of certain specialized IT skills. Increasingly, innovation, collaboration and employee productivity work is migrating out into the business, often onto the Internet itself. As the need to work and partner across organizations continues to grow, more and more firms will need to learn to effectively *live on the Web*.

In Figures 1 and 3, we presented the two simple images shown below, the first representing the idea of business/IT co-evolution and the second showing the four primary computing alternatives — business units, partners, the cloud and Central IT. As mentioned earlier, these high-level depictions inevitably mask a great deal of underlying complexity, but can help clarify changes in strategic direction.

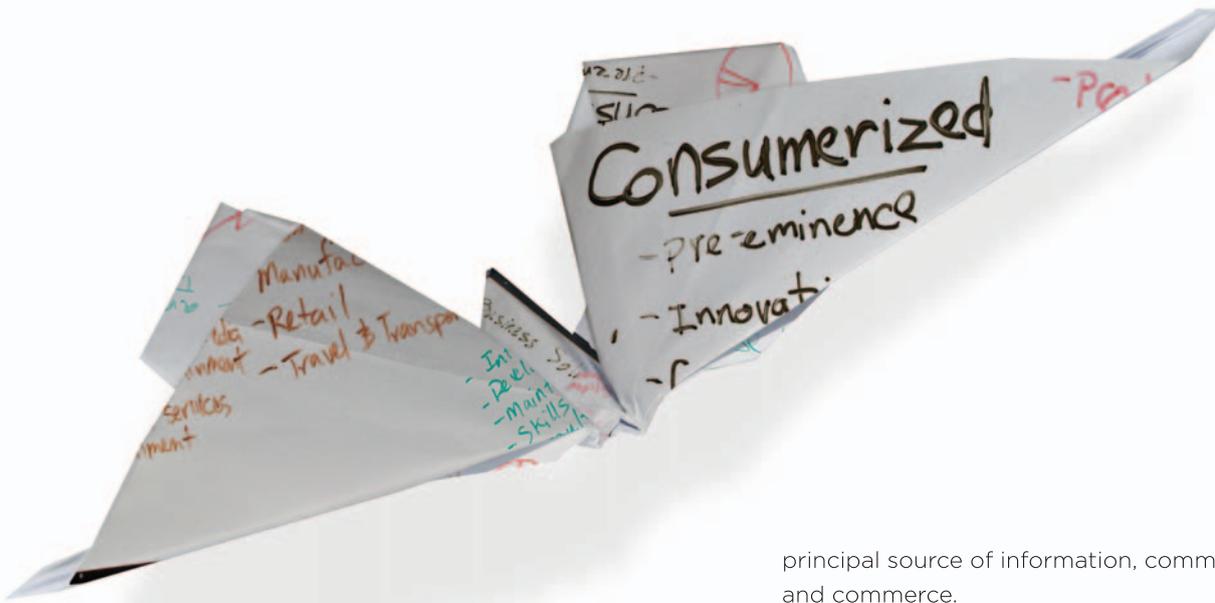
The scope of this underlying complexity has become clear during our research. The 15 strategic options shown in Figure 4 are by no means a complete list, but they illustrate the wide range of viable strategic decisions faced by many large organizations. In thinking about this list holistically, we have three main reactions:

- First, there is nothing even remotely resembling a single answer or a one-size-fits-all approach. In most firms, the decision about what to do in each of these 15 areas remains very much open for debate. While there is a general shift toward loosely coupled services, empowered employees, partnering, variable costs and other dimensions, the pace of these changes varies widely

## Enterprise IT Should Mirror the Organizations It Serves

1. In-house resources vs. vendor partners
2. Centralized efficiencies vs. decentralized focus
3. Global consistency vs. country autonomy
4. Shared services vs. independent business units
5. Offshore vs. onshore resources
6. Empowered employees vs. locked down PCs
7. Entrepreneurial risks vs. traditional IT control
8. Product vs. back-office IT
9. Tight architectural design vs. loosely coupled processes
10. IT professionals vs. business relationship managers
11. Prime contractors vs. best-of-breed suppliers
12. Packaged software vs. Software-as-a-Service
13. Virtual resources vs. dedicated systems
14. Private vs. public infrastructure
15. Fixed vs. variable costs

**Figure 4 — Strategic and operational diversity**



enough that the overall trends mean relatively little to the strategy of any one firm.

- Second, when we tallied all of any one organization's choices among the alternatives in Figure 4, we quickly gained an impression of not just that firm's IT strategy, but its business culture and operating model as well. This is a good example of business/IT co-evolution in action, as IT decision making increasingly should mirror and/or lead the overall direction of the firm.
- Finally, while strategic concerns often take a back seat to cost reductions during economic downturns, customers should always keep in mind that whether they debate the in Figure 4 issues or not, there is always a *de facto* strategic model in place, largely defined by the answers to these types of questions. Firms must regularly reevaluate whether their existing operating model is appropriate for their current business conditions, be the times bountiful or difficult.

### Consumerization and the "cloud"

During 2008 and into 2009, client interest in what is widely referred to as *cloud computing* has risen sharply. While it is easy to view this phrase as just another IT industry buzzword (such as Web 2.0, Software-as-a-Service, utility/grid computing and, before that, application service providers), many clients seem to sense instinctively that there is something powerful underway, even if they themselves are not strongly affected by cloud computing today.

For the last five years, we have been researching what we call the *consumerization* of IT, our belief that the locus of IT industry innovation that was once clearly in large enterprises is now just as clearly in the consumer sector. There are now more than a billion Internet users, and this creates entirely new technology challenges, scale economies and mass-market opportunities. The Web is rapidly surpassing all other media, becoming society's

principal source of information, communication, entertainment and commerce.

We have long argued Enterprise IT would tend to underestimate the impact of these changes because it did not feel their effects nearly as directly as consumers and small businesses, and our research continues to bear this out. Understandably, many CIOs have adopted a skeptical "show-me" attitude. Nevertheless, we have also long believed the eventual impact on Enterprise IT would be profound, and thus we have been seeking a framework with which to describe the expected market transition.

Oddly, the best model seems to be an older one: Geoffrey Moore's *Crossing the Chasm* was first published in 1991 as a guide to high-tech vendor "marketeers" seeking to move their ideas beyond the visionaries and technology enthusiasts to mass-market success. Moore stresses the importance of developing a series of niche markets ("bowling alleys" in his terminology) that, taken together, eventually enable a broad market shift.

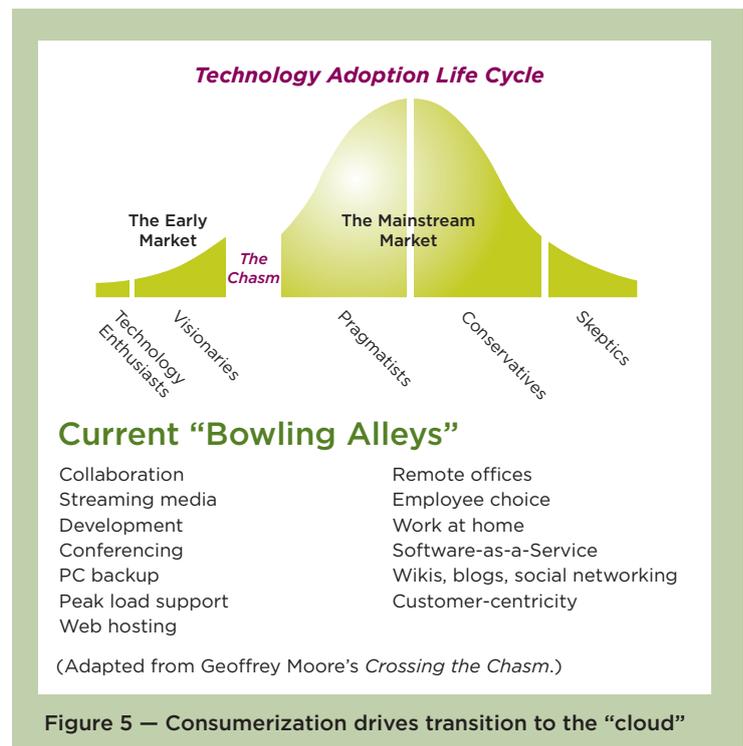
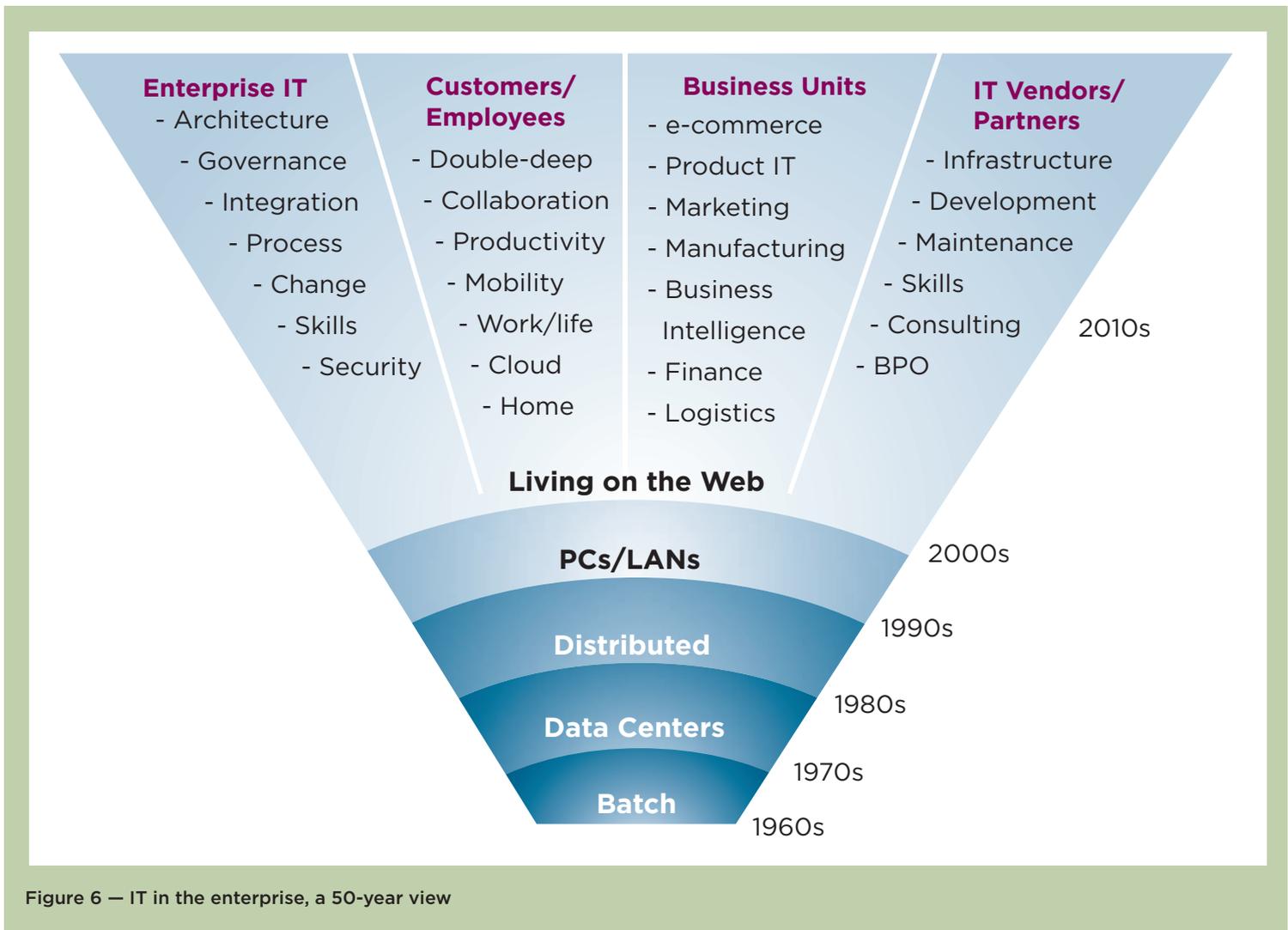


Figure 5 — Consumerization drives transition to the "cloud"



We believe this pattern is now reoccurring with cloud computing. While there is no one dominant cloud application, and radical Enterprise IT change has yet to occur, a wide range of niche markets has already been established — see the list in Figure 5 — each with its own proponents and expanding market support. The result is a steady and accelerating transition that over time will prove fundamental, as more and more new work and value shifts to the Web.

Of course, this proliferation of cloud computing suppliers, services and capabilities creates its own set of IT challenges in terms of strategy, integration, reliability, service levels and security. These entirely legitimate Enterprise IT concerns also tend to suppress the overall rate of market change. This is why we believe the shift to cloud computing in large enterprises will be much more of a long transition than a sudden *big switch* (to use author Nicholas Carr’s widely used terminology).

Our research also shows that the pace of this transition will vary significantly by industry. Those sectors with relatively low security requirements such as news, entertainment, retail and education will move much more quickly than high-security sectors such as defense, aerospace, government and pharmaceuticals. But, make

no mistake, the Internet will be the backbone of the 21st century enterprise, and just about every organization will need to think through an optimal transition path.

**Business and IT boundaries will vanish**

In summary, the role of IT in the modern enterprise has been expanding steadily for more than 50 years, and will undoubtedly continue to do so. Virtually every business function and process, as well as the work of virtually every employee, will be integrated into some form of enterprise information system. Indeed, we are not far from a time when nearly every machine, product, component and thing is also part of an increasingly connected world.

This inexorable *pervasiveness* brings with it new challenges in IT governance, management, control and decision making. With so much IT activity going on, it is all but impossible to funnel every significant business/IT decision through any centralized group, and thus business units must take responsibility and employees must be empowered, with non-core work often offloaded to partners. Otherwise, there will simply be too much to do.

These differences in quantities also result in changes in qualities. As technology and organizations increasingly evolve together,

the once rigid boundaries between business and IT will largely go away. We have used the term *co-evolution* to describe this emerging environment where both improvements in information technology and the ingenuity of companies and customers have an equal and iterative say in the co-creation for future business/IT value. The world is becoming double deep, binding relevant information technology know-how with particular business functions and skills.

As shown in Figure 6, roles will likely clarify over time. We believe the Central IT function will steadily gravitate toward an oversight and managerial role, responsible for areas such as architecture, integration, change and security, more like traffic cops than builders of cars or roads. In the most advanced cases, IT architecture will be at the heart of the business operating model, inseparable from quality, efficiency, innovation and agility.

Perhaps the biggest wild card and toughest challenge for Enterprise IT management will be the increasing pressure for employee/customer consumerization. CIOs recognize there is no way traditional private infrastructures can keep pace with the rapid improvements in the Internet cloud. But, at the same time, there is no clear path from one world to the other. The very idea of moving to the cloud via a series of specialized, niche services just about guarantees a long and complex management challenge.

From an economic perspective, the current market downturn will slow some of these trends while accelerating others, and no one knows how tough the current business environment will get. (See "Recessions, Renewals and the Search for Silver Livings," page 10.) But history shows recessions and heightened cost pressures tend to reset expectations and clear the way for the future, and in this future the most successful firms will be those that develop an agile virtual enterprise, while managing the long transition to living and working on the Web.

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**DAVID MOSCHELLA** is global research director for the LEF Executive Programme.



**Our Leading Edge Forum (LEF) provides clients with access to a powerful knowledge base and a global network of innovative thought leaders who engage technology and business executives on the current and future role of information technology. Focusing on the realistic use of technology, the LEF helps clients understand the business implications of new technologies and takes a practical, but aggressive, approach to the future.**

**Alex Fuss** conducted the research for the *Digital Disruptions* report as CSC's 2008 LEF Associate. A seasoned technologist with over 25 years of information technology experience, Alex specializes in researching and leveraging leading-edge technologies to build enterprise architectures for innovative products and services, primarily in the financial services industry. He is a longstanding member of the LEF Executive Committee.

**Paul Gustafson** is an accomplished technologist and proven leader in emerging technologies, applied research and strategy. Astute at recognizing technology trends, how they interrelate, and

their implications for business, Paul brings his insights to bear on client strategy, CSC research and CSC leadership development as director of CSC's LEF.

**Bill Koff** is vice president and chief technology officer for CSC's Office of Innovation, which includes the LEF. A career consultant for 31 years, including 23 years with CSC, Bill is a frequent speaker on technology, architecture and IT trends.

**Lem Lasher** is president, Global Business Solutions Group, and president of CSC's Office of Innovation, which comprises the LEF and several internal research and

knowledge management groups.

**David Moschella** is the global research director for CSC's LEF — Executive Programme. David's key areas of expertise include globalization, industry restructuring, disruptive technologies, environmental strategies and the co-evolution of business and IT.

**Doug Neal**, a Research Fellow for the LEF — Executive Programme, is responsible for research into innovating through technology. His focus is on the intersection of strategy, business operations and technology.



## **Worldwide CSC Headquarters**

### **The Americas**

3170 Fairview Park Drive  
Falls Church, Virginia 22042  
United States  
+1.703.876.1000

### **Europe, Middle East, Africa**

Royal Pavilion  
Wellesley Road  
Aldershot, Hampshire GU11 1PZ  
United Kingdom  
+44(0)1252.534000

### **Australia**

26 Talavera Road  
Macquarie Park, NSW 2113  
Australia  
+61(0)29034.3000

### **Asia**

139 Cecil Street  
#06-00 Cecil House  
Singapore 069539  
Republic of Singapore  
+65.6221.9095

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*The mission of CSC is to be a global leader in providing technology enabled business solutions and services.*

*With the broadest range of capabilities, CSC offers clients the solutions they need to manage complexity, focus on core businesses, collaborate with partners and clients, and improve operations.*

*CSC makes a special point of understanding its clients and provides experts with real-world experience to work with them. CSC is vendor-independent, delivering solutions that best meet each client's unique requirements.*

*For more than 50 years, clients in industries and governments worldwide have trusted CSC with their business process and information systems outsourcing, systems integration and consulting needs.*

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**CONTACT CSC WORLD:** [world@csc.com](mailto:world@csc.com)

**VISIT:** [www.csc.com/cscworld](http://www.csc.com/cscworld)