

Enterprise 3.0

How IT's All Going to Change

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Introduction

I've said it before:¹

"We have significantly underestimated the impact that the World Wide Web is having – and will continue to have – on our personal and professional lives. Within five years the Web will become the dominant personal and professional platform for communication, collaboration, entertainment, learning and all forms of business transaction processing. Within ten years the personal/professional merger will be complete with virtually no distinctions among what we do to live and what we do to work. The prediction here is that significant aspects of our personal and professional lives will move to the Web, be managed by Web-based providers and support an agility and mobility that we're unable to define or appreciate today. This means that everyone will become immersed within, and dependent upon, the Web."

I've also said:

"It's hard to imagine anyone handing out heavy Wintel monsters to employees in the early 21st century. Why not just give them all thin clients with continuous network access to software and data base applications that sit on servers managed by trusted third-party providers? Or why not just give them smart phones or netbooks? A dwindling number of users will remain 'power users' and require as much computational power as the industry provides. Most users do not require a great deal of computational power or local storage on their personal devices. They can perform more than adequately on thin clients with no local processing and no storage. It's hard to find a company that wouldn't benefit from a thin client pilot (or, for that matter, holistic thin client architecture)."

I have evangelized Web 2.0 and social media:

¹ See Stephen J. Andriole, **Living on the Web**, Cutter Consortium. Also see **Managing technology in a 2.0 World** and **Web 2.0 in the Enterprise: What the Data Tells Us About Adoption and Impact**.

“Web 2.0 technologies – wikis, blogs, podcasts, folksonomies, mashups, social networks, RSS filters, crowdsourcing and virtual worlds – when deployed properly, may permit companies to cost-effectively increase their productivity and, ultimately, improve their competitive advantage. Wikis, blogs, and RSS filters have generated the most impact. This technology depends on structured and unstructured data created by anyone and everyone. It leverages the “wisdom of the crowd.” It organizes data quickly and easily, and applications are “mashed up” with “published” application programming interfaces (APIs) that everyone wants to exploit. If ever there was a set of skills and capabilities necessary for survival in the 21st century, Web 2.0 is IT.”

I have predicted all sorts of things, like, for example, the rise of open source, the importance of business process modeling (BPM), the growing role that business intelligence (BI) will play and how digital mobility will redefine the way we live and work:

“We will see the increased adoption of open source software. We will see the widespread adoption of open source CRM and data base applications. Many companies – especially smaller ones – will move toward holistic open source software (OSS) solutions. In response to this trend, the major proprietary software vendors will reduce their prices to avert the increased adoption of open source solutions. As cost and performance metrics are derived from OSS pilots, the adoption of OSS will increase dramatically over the next five years. Prepare to exploit this trend. Learn as much as you can about OSS alternatives and/or exploit the new software delivery models that the proprietary software vendors are offering.”

“Modeling business processes and building process libraries are necessary 21st century objectives. Technology optimization is about improving/replacing/ automating business processes. There are a number of methods, tools and techniques that enable process modeling. You and your vendors should have the capability – fueled by deep vertical knowledge of your business – to model, iterate, re-engineer, replace and/or automate key processes.”

“Business intelligence (BI) is a strategic investment just about everyone needs to make. But in order to achieve true BI – and the predictive analytics necessary to make strategic decisions about the business – investments need to be made in data architecture, master data management, data integrity and all things data. A serious skills gap analysis should be conducted to determine how easy (or difficult) it will be to get to useful analytics. The ability to gain – in near-real time – insights into operational and strategic transactions that directly affect a company’s ability to make money or save money is the objective. The skills and capabilities to do this are essential.”

“The era of fixed-location computing is over. Constant communication is common. The implications for total mobility are far-reaching. On the one hand, there are obvious technology support implications: technology must

be always on, reliable, scalable and secure. But, on the other hand, mobile computing assumes management and governance protocols that by definition must be flexible and adaptive. Mobility is all about agility. One way to jump into mobility services is to define what the virtual office would look like for your industry and for your company. You can then back mobility services into the virtual office model.”

But perhaps the most significant trend we’ve all predicted is about the cloud:

“The essential trend here is rent-versus-buy/install/support. Just about everyone is already renting some number of applications over the Web. The software-as-a-service (SaaS) model will enable the renting trend, since we’ll not only be able to rent standard application packages but we’ll also be able to customize applications via new architectures and standards designed to provide flexibility to clients over the Web. We can also rent servers from Amazon, Yahoo or EMC – among others – for less than a dollar a day (hardware-as-a-service [HaaS]). We can rent just about anything from a growing number of vendors including especially infrastructure services defined narrowly or broadly. Ultimately, this is moving toward “cloud computing,” which will challenge in-house computing on many levels. Managers need to learn all about cloud computing services and at least launch some pilots in the sky. Start with a private cloud if you’re nervous about entering the public cloud, but by all means, get outside and enjoy the weather.”

What does all this mean?

How do all of these trends and predictions combine to define our business technology future?

Enterprise 3.0 is about trends – and outcomes. It’s about radical changes that taken together move us away from silly debates about business technology “alignment” and closer to business technology convergence, the inevitable outcome of technology, business and management trends.

Let’s explore the specific and the general, the specific changes we can expect and the general effect that all of the changes will have on business technology and its relationship to business models, processes and outcomes.

The seven specific questions include:

- ✓ Where Will Software Come From?
- ✓ What Devices Will We Use?
- ✓ What Becomes of “Data”?
- ✓ How Will Web 2.0, Social Media & Web 3.0 Be Optimized?
- ✓ How Will We Innovate?
- ✓ How Will We Acquire Technology?
- ✓ How We Will Organize?

The one general question is simple:

✓ What Will IT Be Like in 2015?

Where Software Will Come From

Software will come from different places for different reasons. One thing is for sure: the hammerlock that the big proprietary software vendors have had on the market – even over the big enterprises – is over. While they may not realize it (yet), their biggest customers are always looking for ways to deliver the same functionality for lots less money (and better service). Our research with CIOs clearly demonstrates that the vast majority of technology buyers believe that **software costs way too much**.² The big software vendors must change their pricing models, open their architectures and learn to love hosting – by themselves and third-party partners – if they want to grow. But the days of 60% - 70% profit margins are over. It's only a matter of time before the major enterprise software vendors cannibalize their own business models to keep market share.³

Another major change will be active versus passive software design. Passive design is what software engineers have practiced for decades: someone identifies “requirements” and then some others code functionality into inflexible software applications. Every- thing's fine until a new requirement emerges and changes must be made. SAP (and others) have perfected the “do IT my way” approach to software design: they – as many others – have embedded rigid processes into their applications and declared that the really “smart” users of their software will learn to adapt to the embedded processes versus customizing their near-perfect applications. Company after company deployed SAP (and other ERP) software and then wrestled with the process changes necessary to optimize the use of the applications. Enhanced functionality comes in the form of releases where the proprietary vendor decides which new features will be released and when they will be released and supported by the supreme creator of the software. In many respects, the embedded rigidity of 20th century proprietary enterprise software applications represents the way we acquired, deployed and supported technology way back in the day.

Active design assumes flexibility and extensibility. It assumes variable functionality. Instead of rigid embedded process, active software architectures enable the addition or subtraction of functionality through component architectures and application programming interfaces (APIs) that will grow increasingly flexible and available from a variety of sources including the original authors of the software and all kinds of software mercenaries. APIs will make it possible to re-engineer functional designs in near-real-time. Even today we have

² The CIO Advisory Council of Villanova University's School of Business (VSB) comprised of local and regional CIOs and CTOs nearly all report that enterprise software licenses are way too expensive. Much more significantly, all of them report that they are constantly looking for ways to reduce software costs. This, of course, means that proprietary software vendors like Microsoft, Oracle, IBM and CA need to worry about alternative – and cheaper – software delivery models. The large enterprise software vendors have no choice but to offer alternative software delivery models, especially pay-by-the-drink models. Other Cutter research echoes similar sentiments.

³ They will persist with the current enterprise licensing models for as long as they can. When the well runs dry they're move quickly to not only offer new pricing alternatives but claim that they supported alternative pricing all along. Cynical? Not really. Proprietary software vendors have charged as much as they can for their products and services for decades. Why would they seek ways to charge their customers less? The answer lies in urgency and alternatives: they will adjust their pricing only when they have to; they will offer alternatives when the competition puts a gun to their heads.

enough APIs to make business analysts and requirements managers salivate, and every month more are published. Software will be designed in interoperable pieces, not monolithic structures. APIs and other components will enable functional interoperability, extensibility and adaptability.

All of this enables a new software artifact: the immediate mashup. Mashups represent the new prototypes, and the new mashup development environments represent what we used to describe as rapid application development (RAD) integrated development environments (IDEs). Mashups are the poor man's – or impatient man's – applications. While today's mashups are toys, tomorrow's will be sturdy, interoperable and extensible.

What about open source software (OSS)? The adoption of OSS will rise. But the real impact will be in the larger open architectures that OSS encourages. More and more pieces of proprietary software will be built around open standards. The whole service-oriented architecture (SOA) trend relies upon open, re-usable and catalogue-able components. For software to truly become a service, it has to open up – and inventoried.

Beyond open architecture are the specific OSS applications that are challenging their proprietary twins. Osalt.com lists the major proprietary software along with its open source alternatives (<http://www.osalt.com>). It's amazing the number of open source applications that have impressed even the most conservative IT buyers over the past five years. Is there a trend here? Clearly. OSS is creeping into every layer of the software stack; it's also appearing under its own labels: where no one sees Apache, everyone sees what's happening with Google apps, Google docs, OpenOffice, MySQL and SugarCRM among lots of others.

An important aspect of all these trends is the location of software design and application development expertise. Not too many years ago, all of this was a black art controlled firmly by an elite core of software engineers. **But today – and forever – expertise is shared among traditional software engineers, applications integration and interoperability specialists, and API-savvy business analysts.** Put another way, the premium we used to pay for computer scientists can now be distributed across an array of business technology professionals. This is a major change from just five years ago. Ten years ago one had to be multilingual to live in software world.⁴ Things are very different today. "Programming" as we've known it for decades, will morph into a variety of skills and competencies (much, probably, to the chagrin of the software engineering community). There will be a set of professionals highly skilled in architecture, application programming interfaces (APIs), and mashup technology that may well become the requirements-fulfilling front line of transaction processing. Perhaps the best indication of how successful this new set of professional becomes will be measured in the go-to behavior of their business partners: if the business tilts toward them to satisfy requirements – instead of the traditional systems development life cycle (SDLC) crowd – then "programming" will have morphed to problem-solving. None of us should be surprised if programming and programmers look and act very differently by 2015.

⁴ We know at the university that computer science just isn't what it used to be as a major. While there's a small rebound, the overall number of computer science majors has fallen dramatically over the past ten years. The same trend is true of computer engineering and software engineering majors. And where do they go to work? Twenty years ago they went to work for both the creators **and** users of software, for the technology vendors **and** the vertical industries that used the technology. Today, software engineers go to work for hardware and software design and development firms, and that's about it.

Software will integrate and interoperate. The requirement to stay with as few vendors as possible will disappear as open interoperability standards will finally overtake the need to stay within one vendor's architecture. This will free us to finally drive software choices from imprecise requirements, rather than the other way around.

It's impossible to ask the question – “where will software come from?” – without mentioning the Apple App Store. The number of applications appearing monthly is staggering. But more significantly the App Store represents a whole new software distribution channel. Thousands of software developers are developing applications as you read this report. Thousands more are anticipating additional distribution channels when other vendors replicate Apple's approach. Even more stunning are the prices of the software on these stores. As we've seen, many robust business applications sell for way under \$50. Some cost less than \$10. Expense reporting? Time management? Basic accounting? It's all there. What this means for all of us is a whole new way to define software applications, whole new ways to acquire them and price points that are unheard of – especially given what corporate software buyers are used to paying. Will Microsoft open an app store? How about Oracle or IBM? Will app stores remain independent? Or will they go corporate?

Finally – and we'll discuss this in more detail later in this report – there's the location of the software we actually use to enable communication, analysis and transaction processing. Does it sit on your – or your provider's – server? Does it matter? The slow movement of data center responsibility from internally-serviced centers to centers in the cloud describes the journey that software has taken over the decades – not to mention the journey that pricing has taken over the same period. We'll see more and more pay-by-the-drink pricing models, even if the drink only takes a few minutes.

So where will software come from? Just about everywhere. Software design and development (in the form of business applications) will be shared and distributed among software engineers and business analysts using tools and techniques that the industry will provide as part of the on-going march toward openness and interoperability. The whole notion of releases, upgrades, service packs and version control will continue but no longer dominate our ideas about software availability. Waiting for tomorrow's software release to solve today's business problems will occur infrequently as functional alternatives grow in number and capacity. Why wait, when you can build a mashup? The whole dynamic that the software industry has enjoyed over corporate transaction processing will change when they no longer control transaction processing with ill-timed releases and rushed-to-market service packs. IT's all going to change.

Devices We Will Use

There's no lower hanging fruit than thin fruit. The adoption of Web-enabled smart phones is outpacing just about every technology in history.⁵ As form factors have improved, so has

⁵ MorganStanley reports that the adoption of mobile Internet technology has outpaced the adoption of all previous technologies in the history of new technology adoption and penetration. See Mary Meeker, Scott Devitt and Lang Wu, “Economy + Internet + Trends, Web 2.0 Summit, October 20, 2009, San Francisco, CA.

functionality. Lots of assumptions have been challenged along the way. For example, how many of us believed that no one would watch video on a one inch by one inch screen? As it turns out, lots of Gen Xers and Ys are quite comfortable watching short – and long – videos on very small screens. Many of the digerati also believe that soft keyboards would never be accepted by hard core text messagers. Wrong again. Device adoption is not driven by form factors or exotic functionality, but by connectivity and reliability around basic services. Put another way, the assumptions that the traditional human factors crowd have made over the years about usability, form factors, ease of use and even aesthetics may not always be valid.

Smart phones will dominate access to the Web through which we'll gain access to our data, applications and communications. The number and variety of mobile Internet devices will redefine the way we compute and communicate. Continuity and ubiquity will define the next era of computing and communications.

Why does it matter? In the 1980s and 1990s we assumed that there should be one corporate machine – the standard blessed by the company's governance policy. We assumed this for several reasons. First, we correctly believed that buying and supporting one machine was cheaper than buying and supporting whatever people felt they needed to do their jobs. Second, the industry really didn't offer us much choice: while there were lots of different PC manufacturers in those days, there weren't too many alternative architectures. After all, this was the birth of the "Wintel" machine. Finally, even if the industry gave us a lot of different machines they wouldn't have been able to communicate with each other. So we were pretty much stuck with the one machine/one employee/one company model. When interoperability standards emerged, everything changed, and when consumerization became a driver of technology adoption, things really changed – and quickly. Now we have all sorts of devices that interconnect. But more to the point, we have multiple devices that satisfy personal and professional computing and communication requirements for a growing percentage of people (that we used to call "users").

Access devices in 2015 will look, feel and act differently from one another. Variation will be widely accepted – even encouraged – since the relationship between variation and support costs will disappear. The desirability of machine standardization will yield to the imperative of interoperability standardization. Requirements will be defined around roles and requirements – and the devices needed to satisfy those requirements. The distinction between consumer and corporate devices will blur. It just won't matter what devices we use to connect to the Web, our internal data bases and applications and anything else we need to access in our private or public clouds.

We should prepare for a whole new class of mobile Internet devices as well as IP (Internet Protocol) ubiquity. This means that form factors – at least how we think about them today – will likely change dramatically. Devices, for example, will be both stationary and portable with docking stations distributed throughout your personal and other worlds. This means that the iPod/phone/browser/dashboard will be mobile **and** stationary through access to docking stations that make it simple for us to carry, park or recharge our devices.

Synchronization will be automatic and continuous.

Devices will be customizable. You might want a two inch by two inch screen; I might be fine with a smaller one. You might want a soft keyboard; I might want a virtual one. Tablet PCs will give birth to tablet smart phones, and so on, until we all have the option of building a device in much the same way we can interactively customize a car online today.

Companies are unlikely to buy PCs or other devices for their employees. Bring-your-device-to-work-and-we'll-connect-it is the new mantra in 2015. Between 2009 and 2015 companies will wean their employees off of their hardware budgets and either provide them an annual credit for their work device or just remove the "benefit" altogether.

There's no question that all of us need to access Web content and transaction capabilities is a very thin, throw-away client. We should focus much more on the virtual server than on the device used to access it. In fact, given communications technologies and trends, it makes sense to invest in the "host" much more than the "client." (There's also the digital divide issue: the cheaper the access device, the more people can participate in the ongoing digital revolution.)

First and foremost, network access in 2015 will be ubiquitous: we'll use desktops, laptops, smart phones, other thin clients, and a host of multi-functional converged devices to access local area networks, wide area networks, virtual private networks, the Internet, hosted applications on these networks as well as applications that run locally on (some of) the devices. The networks work today; tomorrow they will be bulletproof.

Small, cheap, reliable devices that rely on always-on networks make sense. Shifting computing power from desktops and laptops to professionally managed servers makes sense. Moving storage from local drives to remote storage area networks makes sense. Fat clients should lose some weight - as we bulk up our already able, under-utilized servers.⁶

Over time the cost for ultra thin devices will be less than \$100. These thin Web clients will become throw-aways eliminating the break-and-fix/replacement cycle that plagues so many IT shops and frustrates so many not-so-technology-savvy professionals. (The price point will also make the clients affordable to just about everyone.)

Thin client architectures might save the corporate PC. If the cost goes to around \$100 then it may be that companies provide thin clients to their employees. "Support" equals a basket in the corner of the room. But if thin clients are not deployed then all bets are off: some companies will provide PCs, some will not and some will offer an annual credit. But, as suggested above, since the economics are so compelling for either thin clients or small annual credits, we can expect the "fat" corporate PC to go the way of employee-covered health insurance. By 2015 less than half of the largest enterprises will still be providing free computers-with-support to their employees.

⁶ Server utilization in most companies today is way low. There's an opportunity to reduce the number of servers at work today, virtualize even more, and provide all necessary back-up and recovery services with less money than we spend today – just on servers.

What Becomes of “Data”?

Data will always be king. But the king has an enormous – and still growing – court. Data is no longer owned by the enterprise. It’s created by everyone: vendors, customers, suppliers, partners, managers, executives, strangers, bloggers and vagabonds, among anyone else that would like to offer insights, solve problems or buy stuff. Data is both proprietary and open in 2015. Business “intelligence” is about insight, interpretation, forecasting, planning and adaptation. It’s not about data warehousing or master data management, as important as these activities are as enablers of BI and larger business analytics.

Enterprise 3.0 assumes that companies will collect, refine and leverage data, information and knowledge regardless of its source, location, or form. This represents a cultural challenge to many companies since “data” has always been seen as a crown jewel not to be shared with anyone. Many companies will remain terrified of seeing their data on a server accessible via the Web. But most companies will see the benefit of distributed data base management.

“Data” includes information, knowledge and content – and it’s now dynamic. It lies at the heart of the new business models: without data it’s impossible to customize, personalize, up-sell, cross-sell, automate or gather business intelligence in real-time. But in order to achieve these capabilities, data, information, content and knowledge all need to integrate.

Another trend is the movement from relational to object-oriented data base management. The more distributed our applications – and the greater our need for flexibility - the more we’ll want to move to object data architectures. By 2015, data will by default become objectified.

So where’s all this heading? Everyone’s working on universal data access from all tethered and un-tethered devices. By 2015, structured, unstructured, hierarchical, relational, object-oriented data, information and knowledge will be ubiquitously accessible. While we’re a few years away from all this, it’s helpful to understand the holy grail and to adapt our business models in the general direction of this capability. Microsoft, IBM and Oracle all have plans to provide universal access to – and analysis of – structured and unstructured data. They will get there – and their capabilities will be amplified by a small army of data mercenaries focused on making data, information and knowledge sing.

The push for real-time analytics will drive many data architecture and business intelligence (BI) investments. Real-time (RT) is a requirement that will be satisfied by 2015 technology architectures and platforms. RT dovetails with mobility, with thin clients, mashups, Web 2.0/.30, social media and all of the macro trends that meet in 2015.

How We Will Optimize Web 2.0, Social Media & Web 3.0

Web 2.0 is still all the rage. Social media is on fire. Web 3.0 is the next elixir everyone is waiting to drink.⁷

⁷ See the special issue of the *Cutter IT Journal*, edited by David Coleman, on “The Value of Social Networks in the Enterprise,” Volume 22, Number 10, October 2009.

Web 2.0 represents a sea change in the way we think about requirements, problem-solving, decision-making and technologies. Essentially, Web 2.0 is a response to Enterprise 1.0. Wikis, blogs, RSS filters, mashups, crowdsourcing, podcasts and content tagging/sharing all scream collaboration. In spite of governance and organization structures that deliberately and consciously try to keep people out of the problem-solving loop, Web 2.0 encourages active participation of everyone – even if they don't work for the company. Just a couple of years ago, companies were deciding how they were going to ban social networks and larger forms of social media. Now the same companies are learning to embrace social networks and social media. What's changed? And do the changes have legs?

The changes are permanent. Web 3.0 – discussed in more detail below – will add a semantic layer to enterprise awareness that will deepen our problem-solving capabilities substantially.⁸

There's a hierarchy of capabilities at work here. Web 2.0 and Web 3.0 technologies enable social media. Social media enables continuous collaboration and redefines many business processes, especially ones that have been around for decades. Customer service, innovation, process automation, learning and project/program/portfolio management, among many other processes, are all impacted by Web 2.0/3.0 technologies and social media.

Another important aspect of Web 2.0/3.0 and social media is location awareness. Social media tools and techniques are extended by location-aware applications. Personalization and customization is enabled by location-aware applications. For example, sales and marketing has enormous location opportunities. Knowing where customers are enables real-time personalized marketing: when a restaurateur knows that a customer is fifty yards away from his/her establishment he/she can offer a deal to get them to have breakfast, lunch or dinner at 20% off regular price. And why not? Similarly, location-awareness enables companies to track shopping habits, travel and delivery routes, among countless other activities.⁹

Web 2.0/3.0 and social media – like many of the advanced processes discussed here – require analysis and execution based on assumptions that the processes that the technologies enable are valuable. Social media, for example, assumes that there's value in connecting people willing to collaborate through their affinity with people, places, products and brands. Did anyone really think that Twitter would attract as many people as it has? Customer service and new product releases are especially vulnerable to twittering. Companies now need to worry about what's being said about them in social media. There are now several companies that help their clients "listen" to what customers, partners and employees are saying about them in Facebook, Twitter, MySpace, TripAdvisor, Yammer and countless other social media. Some of these companies listen but others, like ListenLogic (www.listenlogic.com), extract meaning and purpose from social content – which is what companies really want. Put another way, companies need to not only know **what** people are saying about them, but **why** they're saying what they're saying – **and the implications of the conversations on products, services and strategies.**

⁸ See the special issue of the *Cutter IT Journal*, "The Rise of the Semantic Enterprise," edited by Mitchell Ummel, Volume 22, Number 9, September 2009, for a look at many aspects of how semantic processing will change the way companies frame and solve problems with semantic context, awareness and technology.

⁹ For those scared to death about privacy note that location awareness requires customers to opt-in: companies will not spy on their customers – at least not in 2015. Who knows what happens over the long term.

Web 3.0 represents another technological sea change. Wikipedia defines web 3.0 as:

“The Semantic Web (Web 3.0) is an evolving development of the World Wide Web in which the meaning (semantics) of information and services on the web is defined, making it possible for the web to understand and satisfy the requests of people and machines to use the web content. It derives from World Wide Web Consortium director Sir Tim Berners-Lee's vision of the Web as a universal medium for data, information, and knowledge exchange.

“At its core, the semantic web comprises a set of design principles, collaborative working groups, and a variety of enabling technologies. Some elements of the semantic web are expressed as prospective future possibilities that are yet to be implemented or realized. Other elements of the semantic web are expressed in formal specifications. Some of these include Resource Description Framework (RDF), a variety of data interchange formats (e.g. RDF/XML, N3, Turtle, N-Triples), and notations such as RDF Schema (RDFS) and the Web Ontology Language (OWL), all of which are intended to provide a formal description of concepts, terms, and relationships within a given knowledge domain.”

Just as data is king for Web 1.0 and 2.0, context is king for Web 3.0. Smart search, deep problem-solving, intelligent deduction, and other activities will be enabled by Web 3.0 technologies. In fact, when full context surrounds search, transaction processing and problem-solving it will fuel proactive behavior and huge amounts of automation – the real Holy Grail of the Web platform. Web 3.0 will evolve toward wider and deeper context and the Web will continue to grow from repository to enabler. By 2015, much of this context will exist but there will still be lots to do. There's no question, however, that the ultimate capabilities of the Web will have been outlined and partially experienced by 2015. (By 2025, this whole discussion will seem silly.)

How We Will Innovate

Innovation is everyone's job. Regardless of where anyone sits in an organization, innovation is essential to survival and therefore a core competency of every competitive organization on the planet. But how will 21st centuries innovate?

Enterprise 3.0 recognizes innovation as core. As a core competency it will be aggressively funded. But significant amounts of funding will not go to internal research and development (R&D) teams, but to teams distributed across the globe through next-generation crowdsourcing.¹⁰ Once the intellectual property (IP) lawyers figure out what to do with advanced crowdsourcing, even conservative companies will rethink their innovation strategies to include crowdsourcing and other Web 2.0/Web 3.0/Enterprise 3.0 innovation strategies. Internal crowdsourcing, private cloud crowdsourcing and open public crowdsourcing will all be viable crowdsourcing options.

¹⁰ See Carl Adams and Isabel Ramos, Crowdsourcing: A Social Networking Approach to Outsourcing,” *Cutter IT Journal*, Volume 22, Number 10, October 2009.

Beyond crowdsourcing, by 2015 companies will have multi-dimensional innovation strategies. They will build innovation networks consisting of investments, partnerships, incubation, licensing, business process management (BPM) and incentives. Savvy companies will actively pursue seed and early stage investments in companies that can provide innovative solutions. Mergers and acquisitions (M&A) are another piece of the innovation strategy, as are investments in incubators that are ideally located away from corporate headquarters. Licensing is yet another part of the strategy as are investments in BPM, since the re-engineering and automation of key business processes is a key innovation methodology. Finally, smart companies understand the power of positive incentives that should be spread throughout – and beyond – the organization.

Web 2.0 and social media technologies can be used to supplement all of these activities. In fact, Web 2.0 technologies will become integral to the innovation process. Crowd-sourcing and BPM have the two most obvious technology underpinnings but the other objectives can also be supported by technologies including wikis, blogs, RSS filters and content tagging. Wikis and blogs, for example, can replace traditional focus groups and customer service processes.

Innovation is – like the use of web 2.0/3.0 and social media – as much a state of mind as it is a technology. In fact, one of the best practices we finally accepted was that process design should always precede technology investments. The innovation process requires process mapping, performance metrics, strategies, tactics, organization, and funding, among other corporate artifacts to make it all work.

Innovation also requires assessments of internal and external human capabilities. **Creativity is not something that we can teach: three-day seminars will not morph dolts into magicians.** Some of us are more creative than others. Some of us have greater abilities to abstract, induct, synthesize, design and communicate than others. It's 2015 and you know where your creators are because you've conducted your skills/capabilities gap analyses and addressed the gaps by growing internal creative high potentials or found creative teams in your innovation network (as discussed above). But make no mistake: innovation is a process that requires discipline, investment and management. Some companies struggle while others excel. What is it about Apple that works so well? Why did General Motors fail so spectacularly? Where are you on the innovation continuum?

When all is said and done, innovation is a “business” comprised of initiatives comprised of projects comprised of teams comprised of incentivized professionals who “get it.” Enterprise 3.0 is about identifying and funding activities aligned with the organic and digital processes that enable competitiveness and profitability. Innovation is a key process that should be aggressively and consistently funded via continuous due diligence about which part of the Enterprise 3.0 innovation network should receive the most attention at any point in time. The same sourcing questions that apply to technology acquisition/deployment/support should apply to innovation: should we do it in-house, near-shore, off-shore, with partners we know, with strangers, through alliances, through M&A? Innovation is self-renewing – and necessary and sufficient for survival. Enterprise 3.0 companies will invest in innovation as a distributed core competency. Put another way, Enterprise 3.0 companies will cast the innovation net as wide as possible even if it means casting the net well beyond the corporate firewall. Innovation will dovetail with the collaborative, open, continuous themes of the future – or it will lag. By 2015,

innovation will not be a proprietary process controlled by a small number of scientists, engineers, managers and executives sitting in corporate bunkers.

How We Will Acquire Technology

There's no question that by 2015 we will buy technology differently from how we buy IT today and unrecognizably from how we bought IT in the 1990s. Sometimes buried in the discussions about alternative technology delivery models are discussions about core competencies. The real drivers of alternative acquisition/deployment/support models can be found in staged, unconscious and officially approved discussions about exactly what it is a company should do to prosper. Core competency discussions are as old as Peter Drucker and Dale Carnegie. But many companies refuse to engage themselves in discussions about who they are and who they should be. When did information technology become a competency? Furniture is not a competency. Communications is not a competency. Travel is not a competency. Why is IT a competency? For some companies, IT is – and should remain – a core competency, but for many others, IT's way outside the scope of what companies need to do to survive and prosper.

Wikipedia defines core competency as:

“A core competency is a specific factor that a business sees as being central to the way it, or its employees, work. It fulfils three key criteria:

- ✓ *It provides consumer benefits*
- ✓ *It is not easy for competitors to imitate*
- ✓ *It can be leveraged widely to many products and markets*

“A core competency can take various forms, including technical/subject matter know-how, a reliable process and/or close relationships with customers and suppliers. It may also include product development or culture, such as employee dedication.

“Core competencies are particular strengths relative to other organizations in the industry which provide the fundamental basis for the provision of added value. Core competencies are the collective learning in organizations, and involve how to coordinate diverse production skills and integrate multiple streams of technologies. It is communication, an involvement and a deep commitment to working across organizational boundaries. Few companies are likely to build world leadership in more than five or six fundamental competencies.

*“The value chain is a systematic approach to examining the development of competitive advantage. It was created by M. E. Porter in his book, **Competitive Advantage** (1980). The chain consists of a series of activities that create and build value. They culminate in the total value delivered by an organization. The 'margin' depicted in the diagram is the same as added value. The organization is split into 'primary activities' and 'support activities.’”*

What does this definition tell us and, more importantly, how should it inform companies about their investment strategies? First, the definition crystallizes what a core competency is – and is not. Does IT make the list? Some companies can make the argument, but many can not. Where is your company in the core competency sweepstakes?

2015 will make many of the arguments irrelevant. The industry – through its X-as-a-service (XaaS) delivery models – has forced just about everyone to re-open their core competency analyses. The current global economic crisis has also stimulated discussions about core competencies. Finally, the pace of technology change – which has accelerated over the past five years – has shaken even the most technology-committed to re-think their devotion to all things digital.

In many respects, the arguments, analyses and discussions are already over. There's no good reason for most companies to declare IT as a core competency, especially given everything else it has to do to succeed. If you're skeptical about this observation, please re-read the above definition of core competency and ask yourself if IT qualifies as one of the competencies that define "particular strengths relative to other organizations in the industry which provide the fundamental basis for the provision of added value." Ask yourself if IT "provides consumer benefits, is not easy for competitors to imitate and can be leveraged widely to many products and markets."

Once insightful, candid companies end the core competency dance, they will avail themselves of the acquisition/deployment/support alternatives the industry has provided. The path will be simple: infrastructure first, followed by applications and ultimately "platforms." Services around these activities are wide and varied. The major technology vendors – like IBM, Oracle and even Microsoft – have embraced X-as-a-Service delivery models while other vendors – like Salesforce.com – have been champions of alternative delivery models for some time. The credibility that large vendors bring to XaaS is huge – and validates the delivery models as "acceptable" and "safe" to large enterprises. Companies will assess the impact that cloud sourcing including all of the alternative X-as-a-Service delivery models – SaaS (software), HaaS (hardware), IaaS (infrastructure), PaaS (platform), CaaS (communications), STaaS (storage) and BlasS (business intelligence) – will have on their performance. They will assess the impact private clouds will have (while expressing concerns about public cloud security). Cloud architectures will be developed that determine which services are best moved to the cloud, which should stay standardized within corporate firewalls and what a cloud migration strategy might look like.

How We Will Organize

Organization is always political. Everyone wants to know who reports to whom, who has the biggest budget, the most people and, of course, the most power. We live and die for the organizations we create to satisfy our financial, social and political needs.

Technology organizations have all sorts of structures that assume all sorts of governance policies. Tightly governed organizations like hierarchical organizational structures that keep power and control in the hands of a few corporate professionals. Other structures are more democratic, with power and control shared among specific business and technology professionals. There are reasons why organizations struggle over power, control and

structure. The assumption has been that the wrong structures will increase costs, threaten standardization and challenge governance. So the response was often to lock down technology acquisition, deployment and support processes.

But organizations in 2015 will be loose and fluid, not inflexible. The ultimate requirements will be agility fueled by globalization. The notions of “control” and “ownership” will change fundamentally. The struggle for control and ownership will flip the hierarchical models of the recent past. Operational technology will remain largely centralized by shared services organizations that rely on alternative delivery models to satisfy infrastructure requirements. Strategic technology will decentralize to the business.

As I have described before:¹¹

“Operational technology will remain within the ‘control’ of enterprise IT and its internal and external delivery partners. Note the reference to internal and external partners: it is inevitable that significant parts of the IT infrastructure – operational technology – will be outsourced via X-as-a-service delivery models supplemented by the deployment of open source software, thin client architectures, and, ultimately, cloud computing. The ‘rules’ around infrastructure deployment and support will be written – and enforced – by corporate IT.

“The rules around strategic technology acquisition, deployment and support will be written by the business and edited-without-authority by corporate IT. This dramatic shift in governance reflects the changes in the velocity of business, the need for internal control of business processes and technologies that enable the business – as both creators and end-users – to satisfy their own dynamic requirements.

The structure of the operational technology organization is still more conventional than radical. The conventional pieces include infrastructure architecture, network design, implementation and support, storage management, back-up and recovery, security and risk management, applications support, device procurement and management (servers, PCs, laptops, smart phones, etc.), network and systems management, performance management and infrastructure vendor management, among other operational technology tasks. The rise of vendor management is tied directly to the rise of outsourced services via the new technology delivery models (SaaS, HaaS, etc.). Reporting relationships should reflect all of these responsibilities which are assumed to be integrated and coordinated. External advisory boards may be used to keep the organization well informed about what’s happening with competitors and the industry itself. Process officers should be added to the operational technology organization with the mission of assuring that the key functions of the organization are achieved. The processes should include security, performance measurement and architecture.

¹¹ **Managing Technology in a 2.0 World.**

“The strategic technology organization is a very different artifact. This organization is about business requirements and the fulfillment of those requirements through the development and deployment of applications, investments in analytics (which assumes investments in data and information architecture, master data management and data security, among other areas), the mapping of business processes, and a sustained focus on customers. The strategic processes include innovation, return-on-investment and architecture – which provide the linkage to operational technology.

“Operational technologists should report to the Chief Operating Officer or their equivalent. They should not report to the CEO or the CFO. They should not report to the CEO because operational technology is not strategic and because CEOs do not need to measure infrastructure performance: they need to expect IT to enable business processes that lead to revenue generation. They should not report to CFOs because – especially in this economic climate – they’ll have to ask for permission to go the bathroom – or certainly buy another server. While the mantra of the operational technology organization is cost-effectiveness it should not be cost elimination – the usual mantra of the CFO cult. This is a thin line, but one that should not be crossed.

“There should be a Chief Infrastructure Officer responsible for operational technology with deputies for the five functional and three process areas. The strategic technology organization should report directly to the CEO for some very obvious reasons, not the least of which is the company’s dependency on technology, the role that technology plays in corporate operations and the potential strategic contributions technology can make to the business. But in addition to a bold line to the CEO, the strategic technology organization should have a bold line to the lines of business.”

2015 will define technology as silos organized around internal performance metrics. Instead, business technology convergence will integrate business and technology performance metrics around simple metrics like saving money, making money, improving services and compliance. The religious wars of the 20th century and the cease fire of the early 21st century will yield a permanent partnership between technology and business, a partnership that will have all but disappeared by 2015, reflecting the completion of the convergence mission.

Business Technology Convergence in 2015

So what does it all really mean?

It’s hard to discuss transformation when the current state is so anchored in the previous century. But as more and more 20th century warriors pass the baton to the next generation of business technology leaders, we’ll see major changes in the whole business technology relationship. Enterprise 3.0 is about this new leadership as much as it is about new capabilities, requirements, competition and real-time transaction processing.

The technology and technology management trends of the past thirty years actually seeded the different flavors of technology management emerging now, changes that will persist for decades. In other words, we're about to reach a steady state, a kind of business technology convergence that takes the business technology relationship to a new level. CIOs may well become road kill as the seamless trend unfolds. Note that I'm not suggesting that the CIO position will disappear in the next few years. But I am suggesting that the role will quickly evolve into multiple missions fulfilled by different people sitting in different places in most companies. It's hard to imagine large offices of the CIO persisting beyond 2015. The X-as-a-service technology delivery models, the ongoing budget crisis, the growing technology savvy in the business units and the accelerating commoditization of especially operational technology will all force the office of the CIO to redefine – and then ultimately destroy – itself. IT's only a matter of time. And all of this is good.

By 2015, operational technology requirements have merged with business requirements and vice versa. There's less distinction now between business and technology than there's ever been. We've gone from business technology **alignment** to business technology **convergence** in just a few short decades. Much of the heavy lifting that got us here was due to the efforts of hands-on, in-the-trenches CIOs who worked tirelessly – often in their own self-interest, but tirelessly, nonetheless – to raise the importance of technology at their companies. As it turns out, they may have been too successful: we now need their services – at least the services that made them famous – less now than we ever did. Conducting due diligence around the best infrastructure purchases isn't what it used to be. Spending months and months and months deciding which PCs to buy is no longer considered a good way to spend time. Most of the data center consolidation work has been completed. Thanks to Sarbanes-Oxley and other compliance formulae, we've largely solved the backup and recovery problem. Email? Word processing? Spreadsheets? These are all old problems, long since solved by dutiful CIOs and their minions.

Computing and communications infrastructure has been commoditized. It will always be a commodity around which CIOs – as long as they're around – will deploy due diligence teams to find the best deal, the most reliable hardware, and the very best support. Office productivity applications? Here too the number of options has decreased dramatically over time.

The simple fact is that there's less infrastructure work to do these days. The number of PC manufacturers has fallen to a handful. The decision space around requirements like security, backup, recovery, storage, and even sDiscovery has narrowed considerably over the past five years. Years ago, we would spend a year or two conducting criteria-based analyses of alternative hardware platforms. Today those decisions are made in thirty days or less. Not so many years ago, we used our own people to design, deploy, and support our computing and communications infrastructure. Today we look for smart partners to which we can off-load non-core technology requirements. Eventually everyone will end up in the cloud. Infrastructure will launch a first, followed by applications, and eventually the entire computing and communications platform. The CIOs who survive will be responsible for planning their missions to the cloud. Some of them will do this well and some very poorly: not that many CIOs are deeply skilled in both advanced vendor management **and** cloud computing.

So let's assume that infrastructure moves to the cloud. Let's also assume that infrastructure options are limited. Sitting CIOs know that they have a better chance of lowering their handicaps than finding ways to spend forty hours a week on infrastructure-as-a-service (IaaS). So long as they select the right vendor they can easily get thirty-six holes in every week.

Most companies are much better at operational technology than strategic technology. Strategic technology should move to the business units responsible for profit and loss (P&L). The business managers responsible for strategic applications can source them the same way infrastructure managers will source their applications: from the cloud. The linkage between operational and strategic technology will occur at the architectural standards level. So long as the strategic applications are compliant with the overall enterprise/applications/communications /data architecture they can be acquired and deployed by the lines of business. This means that requirements, business process modeling, re-engineering and performance metrics all move to the business. This frees us from creating business relationship management offices, enterprise project management offices and all of the activities we've supported over the decades to get technology closer to the business. Why not just put technology directly into in the business?

We can finally stop stressing over alternative organizational structures. Should we be federated? Should we be an autocracy? Should we hire storm troopers to enforce our governance policy? Should we become a technology monarchy? Won't it be wonderful to finally stop obsessing over who reports to whom? We'll be free by 2015.

Operational technology should go to the Chief Operating (COO) or Chief Administrative Officer (CAO). An infrastructure manager with deep technology acquisition, operational delivery and vendor management skills can handle basic computing and communications technology. Given technology price/performance ratios, it should be possible to reduce infrastructure costs year after year. Strategic business technology should move into the businesses. Architecture glues operational and strategic technology together.

Conclusions

It was always inevitable. If we ever solved the business technology alignment problem, we were told so many times over the decades, we'd reach optimization nirvana. Is this the end of IT? Yes. It's 2015 and everyone's a chief information officer, or, more accurately, everyone's a chief business intelligence officer. While your infrastructure hums in the cloud, all eyes are on strategic technology and the businesses now directly responsible – and accountable – for business technology optimization.

The enterprise CIO is now gone. The historical responsibilities of the office of the CIO have been distributed to the COO/CAO and the lines of business. Operational technology – that supports all of your company's basic computing and communications activities – serves all of the functional areas as well as all of the lines of business. Strategic technology is business-specific and therefore located in the lines of business.

The professionals who optimize operational and strategic technology are very different people. Rather than impose a one-size-fits-all approach to business technology staffing, 2015 will seek the best people doing the things they're bred to do. Operational technologists will be knowledgeable about computing and communications infrastructures and architectures and – especially – the acquisition and management of operational services. The teams that acquire, deploy and manage operational technology will possess deep skills and capabilities in cloud computing, vendor management and performance metrics. They will also contribute to the

definition and implementation of enterprise/ applications/communications/data architecture used to keep everyone on the same architectural page.

The professionals who optimize strategic technology will have wide and deep expertise in business process modeling (BPM), business analysis, requirements prioritization, competitor intelligence, enterprise architecture and innovation, among all things business. They will be responsible for selecting, deploying and supporting strategic applications through a provider network that's optimized through coordination with operational technology providers and governed by architecture.

Governance will be shared among the lines of business, operational technology managers and technology providers. One enterprise organization will be established to oversee architectural standards and acquisition best practices.

To a great extent, the business technology "alignment" journey will end in 2015. While it may not occur precisely on January 1, 2015 or even in 2016, it will happen. All of the stars are aligned to yield convergence. We struggled for decades to get business professionals to talk to technology professionals, to get requirements "right," to define workable governance and organizational structures, and craft budgets that made sense to competing professionals. We also fought a whole lot about really stupid things, like whether HP laptops were better than Dell laptops, if process engineering should precede technology investments and if business analysts should sit along side their business partners. We fought about everything: should we move to Windows 7 (or 2000, XP or Vista), should we move to Office 2003 (or 2007 or 2010), or should we finally implement automated service level agreements (SLAs)? Who should technology report to? First, it was the COO, then it was the CFO, then it was the CEO and then back to the CFO and then back to the COO. Governance, governance, and more (or less) governance. **The last quarter of the entire 20th century was devoted to finding the organizational needle in the haystack: the perfect governance structure – which gave us imperfect technology standardization and less-than-perfect – though often implemented – exception management worst practices.**

While we were fighting about stupid things, the technologists were developing interoperability capabilities that broke too many strangleholds to list and companies like Apple were creating products that changed the way consumers thought about computing. Facebook, Twitter and the App Store all arrived around the same time. Salesforce.com achieved serious traction and IBM made enormous investments in cloud computing preparing for the inevitable future.

Will the stupid arguments end? Back in the day, many of the arguments persisted because we had nothing better to do, no viable alternatives to the way we acquired, deployed or supported technology. But today – and definitely by 2015 – we have alternatives.

So let the stupid arguments continue. They won't matter very much when they're eclipsed by enterprises of the third kind living in the world of business technology convergence (when the old guard finally passes the baton to the next generation).