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The Emerging Technology Trends That CIOs Should Care About

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EXECUTIVE SUMMARY

Today's technology trends may appear like only incremental changes compared with historic changes like ERP and the Internet, but Forrester believes that we are in the initial phases of a major technology innovation and growth wave called "IT everywhere." We are witnessing multiple trends that, when combined, will drive a dramatic change in technology adoption and use. Some of these trends — like X Internet, mobile, SOA, and BPM — have been around for a few years but are just gaining the footing required to launch them into enterprise use. Others — including Technology Populism, Digital Business Architecture, security and risk management, IT ecosystems, the Information Workplace, master data management, and Dynamic Business Applications — are just truly coming online. CIOs must continuously assess these trends to successfully navigate this new wave.

THERE ARE A LOT OF TECHNOLOGY TRENDS — AND THEY ALL COUNT!

A great deal of technology change is underway, although none seems to be an ultimate transformer of IT in the way that the Internet or ERP suites were. Forrester believes that we are in the early years of "IT everywhere" — a new 16-year cycle of innovation and growth that follows the previous cycle of networked computing for enterprise applications and the Internet. Because we are in transition, we are still digesting the networked computing technologies and just barely seeing the earliest versions of the new IT everywhere technologies. Several technology trends that got their start during the networked computing wave will continue their digestion cycle during the just-starting IT everywhere phase. These include:[1]

- **Service-oriented architecture (SOA) — middleware that enables new component apps.** SOA has gone mainstream, even as firms mature their SOA adoption. Broad-based use of and plans for SOA indicate that SOA's applicability is general in nature and not specific to particular industry situations. But beyond adoption rates, we can see differences in the patterns of usage across different verticals. For example, media, entertainment, and leisure firms have notably higher rates of external integration with SOA than do firms in other verticals.[2] Firms are now at the point with their SOA adoption where they are starting to grapple with the larger questions of the impact on both IT funding models and even the structure of the IT organization.

- **Business process management (BPM) — user-driven automation of manual tasks.** Firms across all industries are looking to BPM to help gain new efficiencies, create a more consistent customer experience, and provide better data insights. And as their BPM use accelerates, a few large firms

are developing centers of excellence for BPM, adopting best practices in five areas: 1) executive sponsorship; 2) process methodology and governance; 3) staffing skill sets; 4) vendor alignment; and 5) key performance indicators.[3]

- **Mobile — beyond laptops to cell phones and PDAs.** Mobile technology is moving beyond laptops and morphing into "mobile Internet devices" — a new family of consumer devices that blend the best of the PC, wireless, and Web to deliver a superior mobile Internet experience. The PC and the wireless industry players will battle to control this new take on mobility, both for consumers and enterprise users. Today's technology is basic but is gaining in popularity; as of February 2007, 73% of US adults owned mobile phones, with 21% of online adults reporting that they had visited mobile Internet sites using the device. Furthermore, 32% of US households owned laptops, and 24% of these owners went online outside their homes. In Europe, as of May 2007, 86% of adults had a mobile phone, 14% of mobile phone users had visited mobile Internet sites, and 26% of adults owned a laptop.[4]

- **X Internet — RFID and sensors at the edge of the Net.** In 2001, Forrester reported that the next tidal wave of innovation will eclipse the Internet as we know it: It will involve an Extended Internet that connects physical objects to the Internet to provide an unprecedented view into the life of products, assets, or even people. But while some innovative companies like BP and Caterpillar have experienced early success with the Extended Internet, most companies have barely scratched the surface. That's about to change, as a potent mix of business pressures and technology enablers will bring Extended Internet deployments into the mainstream during the next seven years.[5]

The New Technology Trends To Care About

The IT everywhere wave is being powered by the emergence of business technology (BT) — the pervasive technology use that drives business results and that is increasingly under the control of business organizations and not IT. This wave includes the following technologies:[6]

- **Technology Populism — Web 2.0 and social networking meet the enterprise.** Thanks to an advancing technology-native workforce, ubiquitous broadband, and abundant collaboration and Social Computing tools, information workers can now provision their own software tools, information sources, and social networks via the Web to support their jobs. Individual people, not IT organizations, are fueling the next wave of IT adoption that Forrester calls Technology Populism. New opportunities are emerging, derived from rich social interaction powered by enterprise Web 2.0 tools, but these come with new risks — like compromised security and privacy and poor control of intellectual property.[7]

- **The Information Workplace (IW) — complex information delivered in the user's context.** The IW is a next-generation digital workplace based on portal, collaboration, content management, and office productivity technologies, plus many emerging technologies in the Web

2.0 and Social Computing space. An IW is quite different from the collaboration, content, and portal products in use in most organizations today because it provides a role-based, contextual, seamless, guided, visual, and multimodal work experience for the user. People in many different roles who are responsible for efforts like enterprise content management, collaboration, office productivity, portals, business intelligence, data warehousing, and BPM report that their organizations are developing IW strategies.[8]

- **Dynamic Business Applications — component apps that target certain roles but change easily.** IT's primary goal during the next five years should be to invent a new generation of enterprise software that adapts to the business and its work and evolves with it. Forrester calls this new generation Dynamic Business Applications, emphasizing close alignment with business processes and work (design for people) and adaptability to business change (build for change). At this stage, the requirements for Dynamic Business Applications are clearer than the design practices needed to create them. But the tools are at hand, and pioneers in SOA, BPM, and business rules — including independent software vendors — have begun to show us the way.[9]

- **Digital Business Architecture — SOA, unified communications, and virtual computing.** Digital Business Architecture is a top-level conceptual model for planning the future of both technology and architecture. Digital Business Architecture aligns planning with a new reality: More and more, the technology design must directly reflect the business design. The business goals for each technology domain are the basis for a taxonomy of seven major strategic platforms for digital business: SOA platform, information fabric, interaction platform, Information Workplace, unified communications platform, business service management platform, and business design platform. These strategic platforms provide focal points around which to structure and design a future technology base.[10]

- **IT ecosystems — gravity wells of products and services.** Market forces of commoditization, miniaturization, industrialization, and globalization, along with changing buyer sentiments, will accelerate a shift in the dominant form of IT delivery by 2012 — from buyers self-integrating technology to having outside providers assemble and manage it. These four underlying drivers aren't new, but their convergence will accelerate this market shift and make it stick, with stable operations farmed out to third parties, new IP sourced from open communities and solution brokers, emerging technologies going to market wrapped in process bundles, and new software investments based on subscriptions rather than ownership. The resulting IT ecosystem structure will place those technology suppliers with the strongest delivery capabilities at the hubs — IBM, Microsoft, Oracle, and SAP.[11]

- **Enterprise master data management — addressing cross-app data use and management.** Master data management's (MDM's) goal is to deliver trusted data throughout the enterprise. But in an effort to open up access to data while enforcing policies and regulations, today's MDM strategies focus on mitigating the organizational, process, and business case challenges that an

enterprisewide, multi-data-domain MDM business capability introduces before considering comprehensive technology architectures. CIOs must recognize and plan for enterprise MDM as a multiyear, multiphase, maturing business capability that will allow the delivery of trusted/quality customer, product, and other critical data.[12]

Security And Risk Management Continue To Drive Changes Across Technologies

Business complexity and increased regulatory and market scrutiny is driving organizations to adopt a structured approach to governance, risk, and compliance (GRC). The goal: to effectively define, manage, and monitor the external and internal business environments. But what exactly is GRC? Individually, each of these three terms may have many different meanings within an organization. The variations appear endless and include corporate governance, IT governance, financial risk, strategic risk, operational risk, IT risk, corporate compliance, Sarbanes-Oxley compliance, employment/labor compliance, and privacy compliance. GRC is a three-legged stool — all three elements are needed to effectively manage and steer the organization. Ultimately, good governance is achieved by proper risk and compliance management — with other things thrown in, of course, like performance management and strategic planning.[13]

RECOMMENDATIONS

CONTINUOUSLY MONITOR TECHNOLOGY TRENDS TO ENABLE IT SUCCESS

The IT everywhere technology wave has no single transformative technology that will single-handedly drive business change. Instead, each of the technologies in this wave will have its greatest impact through collective adoption. As a result, CIOs can't just look to the headlines in *The Wall Street Journal* to figure out what to do to thrive in the IT everywhere technology wave. They must instead:

- **Make a review of technology trends a part of IT's annual planning cycle.** Create a running list of the technologies being assessed and how they do or do not fit with your firm's IT and business strategies. Then, use this list as the foundation of the annual plan, trying to anticipate ways in which the technology trends should play a role in the next round of IT investments. This isn't a new suggestion, but over the past six to eight years, many IT shops have relaxed their technology trend vigil, driven by constrained costs and few new technologies. But CIOs shouldn't be fooled — we've been in a technology digestion phase, and the launch of the next wave is at hand.
- **Charter the enterprise architecture (EA) group to engage the firm's Innovation Network.** Few firms maintain their own research and development labs inside of IT. Instead, even the largest and most aggressive firms engage with their network of service and product providers to understand current technology trends. In many organizations, the EA group brokers the players — from both inside and outside the firm — and drives a process to identify what trends their company should take advantage of and how they should proceed.[14]

- **Use business capability maps to assure relevance to the business' strategies.** CIOs must develop an ability to discuss technology trends in terms of business strategies — not the trends themselves. Business capability maps help do that. These maps are the intersection of business architecture — key business capabilities and the processes and functions that execute them — and the IT architecture — the hardware, software, and IT services that automate the business capabilities.[15]

ENDNOTES

[1] The technology economy has shown pronounced growth cycles over the past 50 years, alternating with periods of technology digestion when growth slows. We are just completing such a digestion period right now; history strongly suggests that another growth wave of IT innovation will begin — and has begun — in 2007 or 2008. The seeds of that next wave are all around us and will accelerate the growth of the tech economy in the coming years. See the June 24, 2005, "The Seeds Of The Next Big Thing" report.

[2] SOA adoption rates among small and medium-size businesses (SMBs), while not as high as those among enterprises, are still broad-based across industry verticals. See the June 16, 2008, "SOA Adoption: Strong Similarities Across Verticals" report.

[3] BPM is slowly gaining a footing as firms find ways to make it work in their environments. See the March 26, 2008, "Best Practices: Centers Of Excellence For BPM" report.

[4] The Internet is no longer confined to the office or the home PC — consumers want access to their now-familiar news, communication, and Social Computing resources on-the-go. To date, though, this has either meant lugging a laptop and searching out Wi-Fi hotspots or severely compromising on what you can do by using a phone's Web browser. Forrester believes that a new category — mobile Internet devices (MIDs) — will deliver on the promise of the mobile Internet but as an additional, rather than replacement, device. To succeed, the PC and wireless industries must blend the best of what they have. To the smart players will come billions in new revenues as consumers add a third device to their lives. See the October 12, 2007, "Defining Mobile Internet Devices" report.

[5] A host of business pressures — coupled with more mature RFID, wireless, and sensor technologies — will spur mainstream companies to adopt Extended Internet technologies. Expect businesses to deploy the Extended Internet in three phases: 1) tactical deployments; 2) adjacent process rollouts; and 3) widespread business process redefinition. While these stages differ in scope, they have one thing in common: At every step, business owners — and not IT — drive the investments. What does it mean? Vendors will win with process-centric ecosystems, and innovative users will turn process innovation into new lines of business. See the September 19, 2006, "The Extended Internet Voyage" report.

[6] Every aspect of the enterprise is increasingly embodied in the technology it uses, from process application-driven business operations to Internet-based interactions with customers and suppliers. Although only a few enterprises recognize the implications of this trend today, within five years, most will realize that this "business technology" (BT) is vital to delivering business results. Enterprises will embrace the competitive

potential of technology and actively manage its use. BT providers will hone offerings to enhance business results, flexibility, and configurability. See the May 7, 2007, "Business Technology Defined" report.

[7] Technology Populism is a wake-up call that forces information and knowledge management (I&KM) professionals to rethink how they currently evaluate, provision, and support collaborative software and services. New policies and guidelines will be paramount. Consider this a call to action. See the February 22, 2008, "Embrace The Risks And Rewards Of Technology Populism" report.

[8] These strategy development initiatives, which usually apply to the entire workforce, are driven primarily by the need for richer customer interactions and a changing workplace. Plus, the explosion of Social Computing in the consumer world is rapidly affecting the enterprise as workers bring their favorite tools and Web sites into the business. The initial focus of Information Workplaces is on delivering content, data, and collaboration services to users in context. Many companies have already embarked on this path, while visionary organizations like Verizon and IBM are pointing the way to an even richer IW future. See the July 27, 2007, "Information Workplace Trends 2007" report.

[9] Most business applications are too inflexible to keep pace with the businesses they support, as they force people to figure out how to map isolated pools of information and functions to their tasks and processes, and they force IT pros to spend too much budget to keep up with evolving markets, policies, regulations, and business models. See the September 24, 2007, "The Dynamic Business Applications Imperative" report.

[10] Digital Business Architecture is an integrated view of multiple technologies driven by a metadata core. See the July 3, 2007, "A Taxonomy Of Platforms For Your Digital Business" report.

[11] In order to stay in the game with these emerging ecosystems, today's vendors and service providers will need to overcome their own inertia around the development and management of IP, their rigid engagement models, and their dated partnering strategies. For more information on the new model that lays out the blurring lines between technology and service, see the January 2, 2007, "The Emerging IT Ecosystem" report. This ecosystem model will transform the software sector into four camps centered around IBM, Microsoft, Oracle, and SAP. See the May 7, 2007, "Solutions-Centric Ecosystems Disrupt The Enterprise Software World Order" report.

[12] MDM frustrates many firms at the same time that it offers them the opportunity to move beyond data marts and data warehouses to an environment where users manage their own data. Leading-edge usage occurs with customer data management and product data management offerings. See the May 16, 2008, "Trends 2008: Master Data Management" report.

[13] Companies face pressure to adopt a comprehensive approach to governance, risk, and compliance (GRC) management. Without proper governance and control, business processes, employees, and systems behave like leaves blowing in the wind — but control and monitoring force them to become more efficient and well-managed. Inefficiencies, errors, and potential risks can be identified, averted, or contained, reducing the exposure of the organization and ultimately creating better business performance. See the November 28, 2007, "Topic Overview: Governance, Risk, And Compliance" report.

[14] Business is looking toward innovations in products, services, and business models to drive growth and profits. Because technology is embedded in many of these innovations, this should be an opportunity for IT to increase its contribution to the firm's business goals. Enterprise architecture (EA) groups are best positioned to lead IT's efforts in this area — but they should not try to do it all themselves. Instead, they should help develop the firm's Innovation Network — a formal web of internal and external resources to identify promising new applications of technology, assess their potential, and transform them to produce the desired business impact. See the June 2, 2006, "EA Groups Should Architect Their Firm's Innovation Network" report.

[15] IT leaders have been challenged to harness the complexity of the business as it affects planning, architecture, and IT operations. This complexity is only increasing, driven by mergers and acquisitions, globalization, and decentralized business organizations. CIOs need a tool that can address IT's importance to business success, flex to reflect ongoing business change, and relate business activities to the bill of IT — IT's hardware, software, and services. Business capability maps provide exactly this tool. These maps provide a picture of the business-IT architecture, relating business capabilities — and their outcomes — to business processes and functions, IT services, and hardware and software. The capability maps have a strong impact across IT — like guiding IT investment decisions and relating IT operational expenses to business results. See the November 16, 2007, "Capability Maps Anchor Business Complexity" report.