

Gartner Predicts: The Future of IT

Gartner SYMPOSIUM ITXPO® 2004

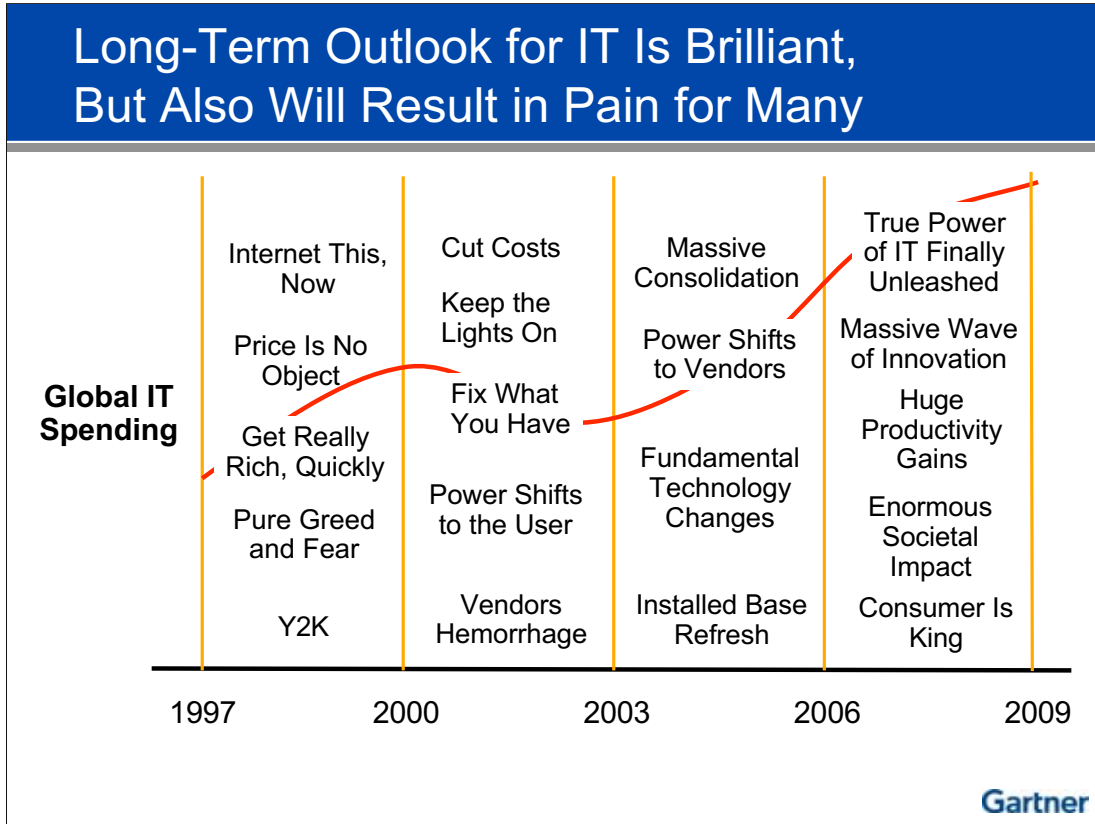


Barcelona, Spain
14-17 March

European Spring Symposium

Steve Prentice

14–17 March 2004
Palau de Congressos de Catalunya
Barcelona, Spain



The past three years have been painful for everyone associated with IT; users, vendors and investors have all suffered.

The industry recovery in 2004 we anticipated last year is confirmed. The combination of key technology advances, architectural changes, market forces and best practices will lead to a good recovery for IT in the near future. However, the resulting, huge impact will be positive and negative. On the positive side, massive productivity improvements, significant increases in demand and enormous infusions of true innovation will occur. On the negative side, hundreds of thousands (if not millions) of workers will be displaced — many of them holding high-paying, white-collar positions.

Gartner Predicts: The Future of IT

Client Issues

1. What will be the most-crucial challenges for IT through 2009?
2. Which market forces and end-user behaviors will dominate IT through 2009?
3. Which technology advances will dominate the IT landscape through 2009?
4. How will the confluence of market forces, end-user behaviors and technology advances affect IT and society through 2009?
5. Who will be selling the winning technologies through 2009?

Client Issue: What will be the most-crucial challenges for IT through 2009?

Strategic Planning Assumption: Through 2005, most technology advances will address current technology deficiencies, not true innovation (0.7 probability).

IT Industry Has Six Fundamental Issues

1. IT costs too much in too many cases.
2. Infrastructure is too fragile, complex and expensive.
3. Cost and time needed to build applications are prohibitive.
4. Cost and time needed to reliably connect to third parties are prohibitive.
5. Financial returns are elusive.
6. Too many vendors are selling the same thing.

Gartner

When we as an industry come to grips with the fundamental challenges facing us, we'll be able to unleash and harness the awesome power of IT. Some of the problems with our industry are due to overhyped promises — some from the misuse or mismanagement of technology and some from outright fraud, but the majority are due to the overwhelming complexity and immaturity of the technology.

The world's best technology end users have achieved amazing results by relentlessly focusing on the real value — the applications — and have been extremely smart in overcoming the inherent difficulties of designing, building and deploying these complex sets of technologies. These end users have employed highly talented people to fix IT's core problems. However, this can't and won't continue.

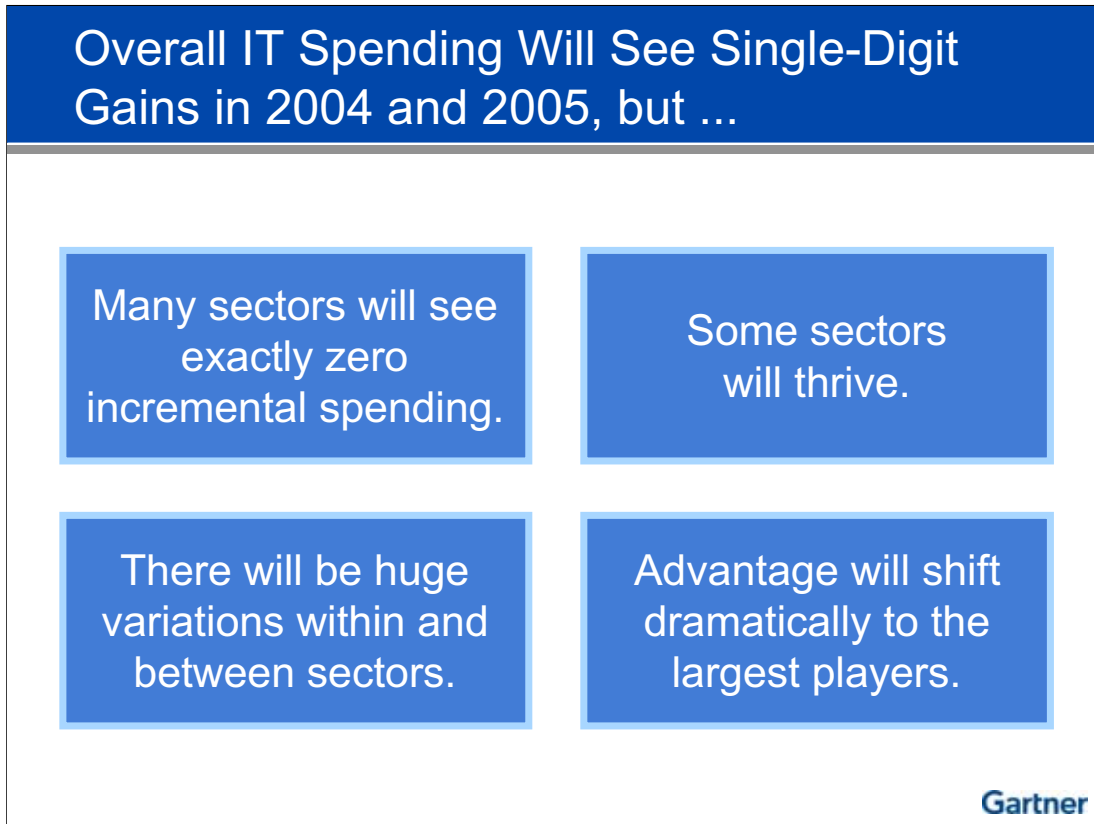
It's time for our industry to finally address these issues, and it's doing so. It won't be perfected overnight, but, by 2007, the cost and time to build and maintain new applications will be significantly reduced by use of Web services and by increased use of outsourcing.

Unfortunately, too many vendors believe their businesses will recover when business spending improves, and that they can continue along, business as usual. This is a terribly flawed notion for most vendors, but not all of them.

Gartner Predicts: The Future of IT

Client Issue: Which market forces and end-user behaviors will dominate IT through 2009?

Strategic Planning Assumption: Through 2005, overall IT spending will increase by 5 percent to 6 percent, but the variations within and between sectors will be quite large (0.7 probability).

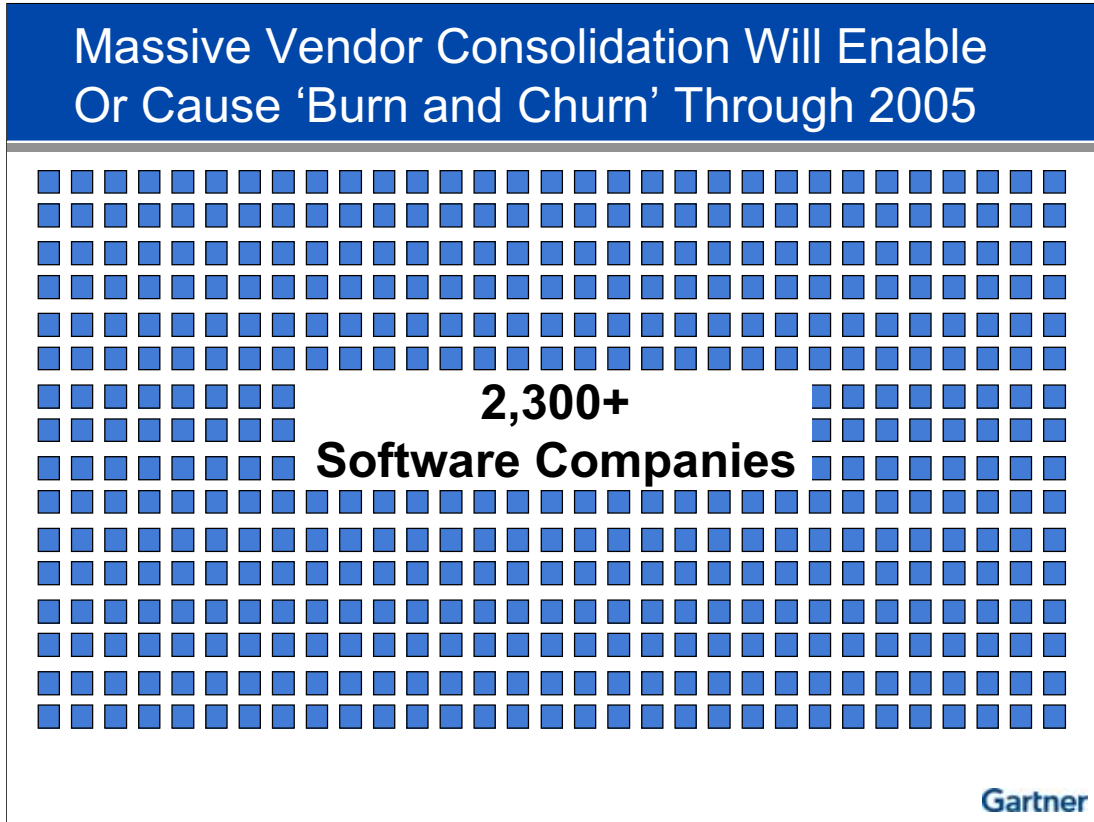


We believe that IT spending in aggregate has bottomed out, and that during 2004 and 2005, growth will be good — at least high single-digits from 2003 levels.

But be careful. Although the overall number will rise, the variations will be huge, depending on individual sectors. Some sectors will rapidly disappear as better technology emerges. Some will see huge incremental spending due to new applications and innovation. Even within a particular sector, the difference between winners and losers will be large.

For the next several years, the advantage will dramatically shift to large, financially strong vendors, because, as we predicted, merger-and-acquisition activities will rapidly ensue (for example, the current PeopleSoft/J.D. Edwards/Oracle debacle is only the beginning). Then it will shift back to the startups, which will be delivering new applications on top of next-generation platforms.

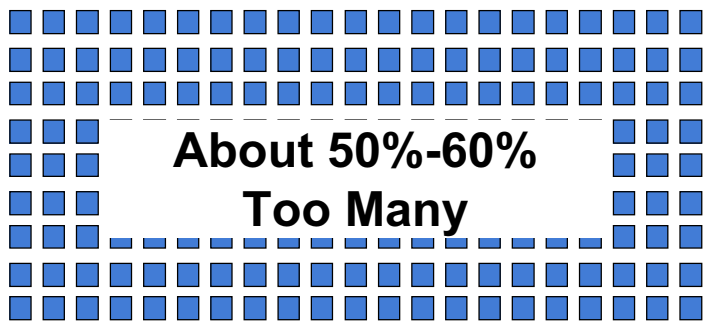
Strategic Planning Assumption: By 2006, at least half of the existing vendors will be acquired or go out of business (0.6 probability).



Client Issue: Which market forces and end-user behaviors will dominate IT through 2009?

Gartner has seen its share of recessions, booms, major technology changes and the demise of previously “invincible” vendors. However, we have never seen the magnitude and speed of the IT industry’s decline, nor the sheer power that end users are wielding. All this will change by year-end 2004 as market forces crush the weaker players, and a few, large vendors dominate most IT sectors for the next several years.

**Massive Vendor Consolidation Will Enable
Or Cause 'Burn and Churn' Through 2005**



**About 50%-60%
Too Many**

Gartner

Strategic Planning Assumption: Previous “best practices” will be the norm throughout the industry starting now (0.8 probability).

End-User Standard Practices

Consider

- ... outsourcing anything non-value-added
- ... standardizing everything you can at base level
- ... rigorously managing your portfolio

Gartner

Client Issue: Which market forces and end-user behaviors will dominate IT through 2009?

Although many organizations can and should outsource IT components at the infrastructure level, many can't and shouldn't because they are at the extreme edge of technology, with skills and business requirements that only they can address. Perhaps the ultimate example of this is eBay. Its business completely depends on the awesome technology infrastructure it has developed, and no one else in the world can do it better.

(eBay's COO is a Gartner board member, but that's not why we're using eBay as the example. It's simply true.)

Client Issue: Which technology advances will dominate the IT landscape through 2009?

Advances in Technology Can and Will Fix Most of the Fundamental Problems

Infrastructure <i>Make it robust, reliable and invisible</i>	Application Maintenance <i>Make it inexpensive</i>
Application Development <i>Make it faster, less expensive and holistic</i>	Application Deployment <i>Make it secure, reliable and interenterprise</i>

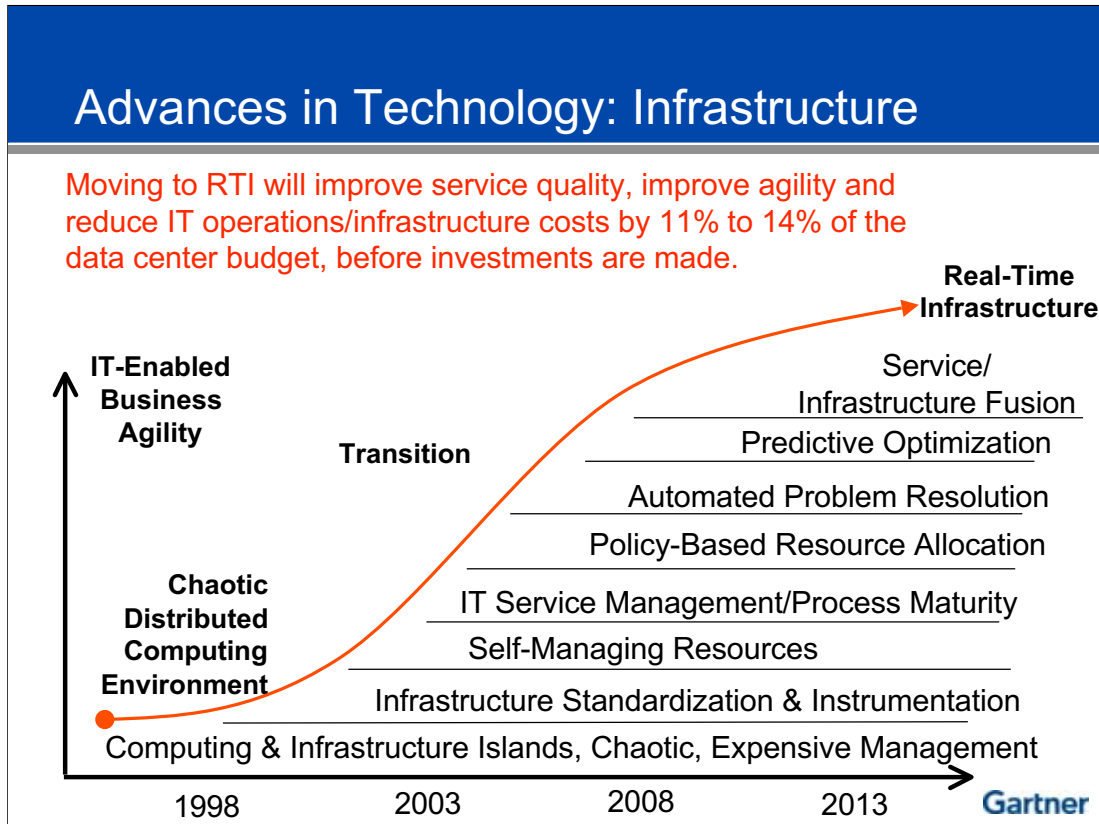
Gartner

The first step toward achieving outstanding results is to split up all functions that comprise a usable system into the four areas shown above. All major vendors and the smart venture capital money is being poured into these four areas to dramatically reduce the cost and time needed for the industry to deliver real value to end users.

The timing for each of these four technology “buckets” to reach maturity will vary somewhat, but the relentless drive for each area to resolve the issues previously discussed cannot be disputed.

Gartner Predicts: The Future of IT

Strategic Imperative: The deployment of real-time infrastructure is inevitable, rolling out in phases through 2008 to drive lower costs, greater agility and improved quality of service.

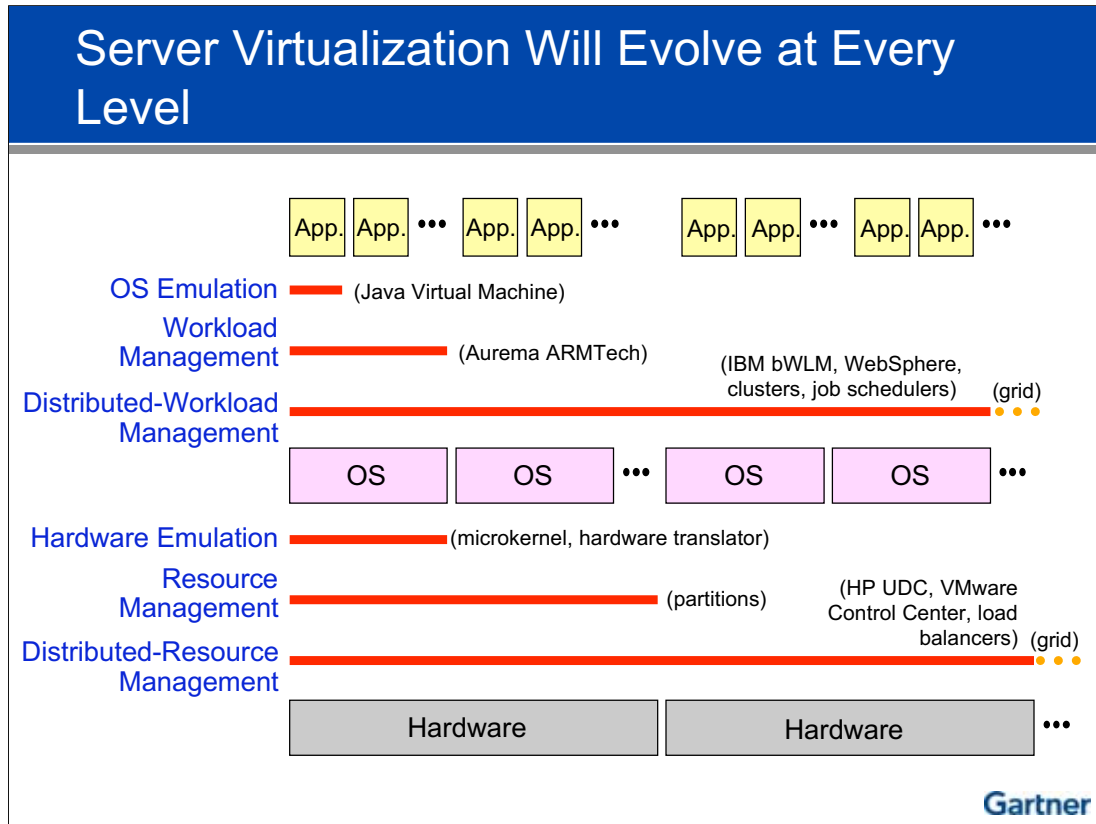


Client Issue: Which technology advances will dominate the IT landscape through 2009?

If an *IT infrastructure* is a collection of client devices, servers, storage, networks, databases and middleware supporting the delivery of business applications and IT-enabled business processes, then a *real-time infrastructure (RTI)* is an IT infrastructure shared across customers, business units or applications where business policies and service-level agreements drive dynamic and automatic optimization of the IT infrastructure, thus reducing costs while increasing agility and quality of service. RTI represents a three- to 10-year vision for the distributed computing architecture and management environments, which will reduce capital and labor costs while increasing IT agility, responsiveness and quality of service. We have dropped the term “policy-based computing services” and replaced it with “IT infrastructure” to align with Gartner’s concept of the real-time enterprise (RTE).

Gartner Predicts: The Future of IT

Strategic Planning Assumption: Enterprises that do not leverage virtualization technologies will pay up to 40 percent more in acquisition costs by 2008, and roughly 20 percent more in administrative costs than enterprises that leverage virtualization technologies (0.6 probability).



Virtualization can also take place at various other points in a server architecture — between the application and operating system (for example, a Java Virtual Machine), between the operating system and hardware (for example, partitions), across multiple operating systems and hardware, and so on.

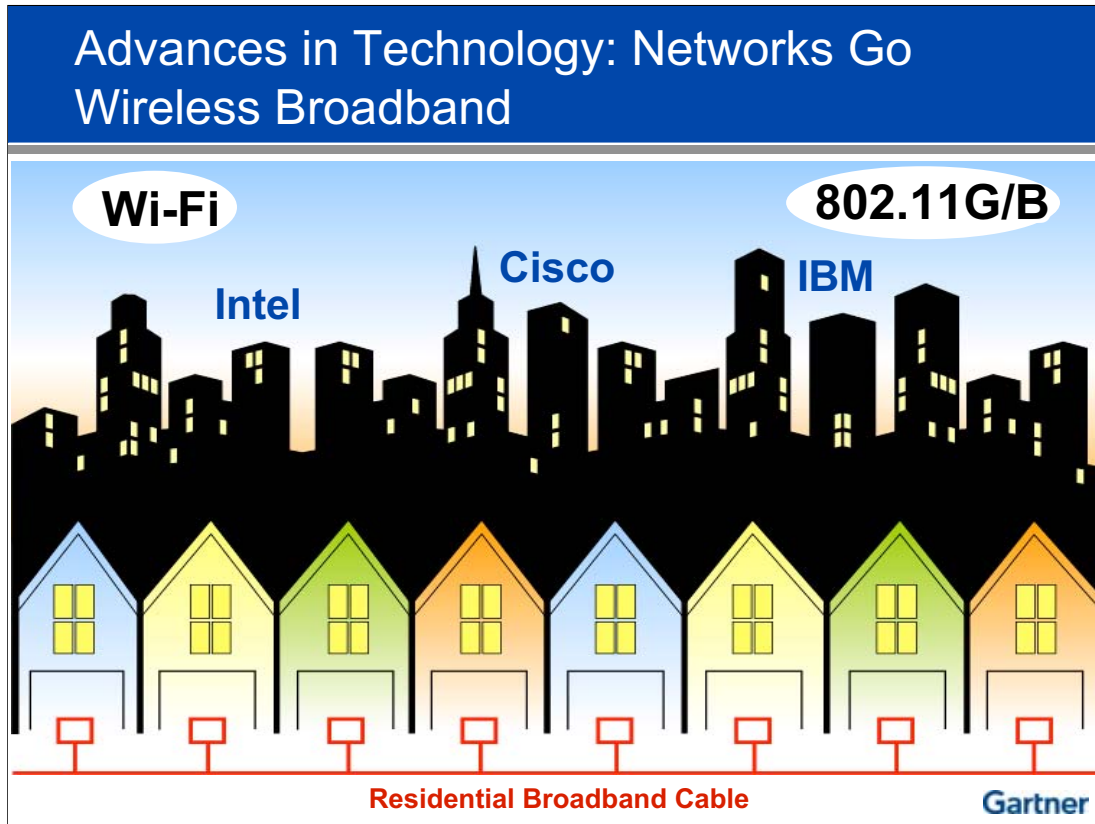
Workload Management: Enabling diverse workloads to effectively run together in a single instance of an operating system by balancing workload resource consumption to achieve business goals and priorities. Examples: Aurema ARMTech, Microsoft WSRM.

Distributed-Workload Management: Enabling diverse workloads to effectively run together and across multiple operating system instances by balancing workload resource consumption to achieve business goals and priorities. Examples: IBM bWLM, HP gWLM, various grid and clustering toolkits, middleware.

Resource Management: Enabling multiple operating system instances to share a specific server hardware resource by balancing operating system resource consumption. Examples: IBM LPARs, HP VPARs/NPARs, VMware ESX/GSX.

Distributed-Resource Management: Enabling multiple operating system instances to share distributed server hardware resources by balancing operating system resource consumption through reprovisioning or, possibly, runtime. Examples: HP UDC, IBM Think Control, Unisys Sentinel, VMware Control Center.

Strategic Planning Assumption: Wireless and broadband technologies will be “good enough” by 2006 to 2007 to be considered required components of most applications (0.7 probability).



Client Issue: Which technology advances will dominate the IT landscape through 2009?


There are three gating factors to widespread deployment of wireless/broadband for mission-critical applications: 1) end-to-end security; 2) standardized endpoints — PCs and personal digital assistants (PDAs); and 3) wide coverage areas that are robust. All three will hit the “good enough” stage by 2006 to 2007 for most commercial applications.

It is likely that market leaders such as Cisco Systems will “finesse” the security issue by licensing its proprietary code at very low cost and then using marketing schemas (certified/compatible with X labels) to usurp standards bodies.

Strategic Planning Assumption: Advances in power management and display technologies will lead to commercially viable next-generation mobile devices by 2007 (0.7 probability).

Advances in Technology: Power Management and Display Electronics

- Power *delivery* technology isn't exciting
- Power *consumption* technology is awesome
- "Always on, always connected"



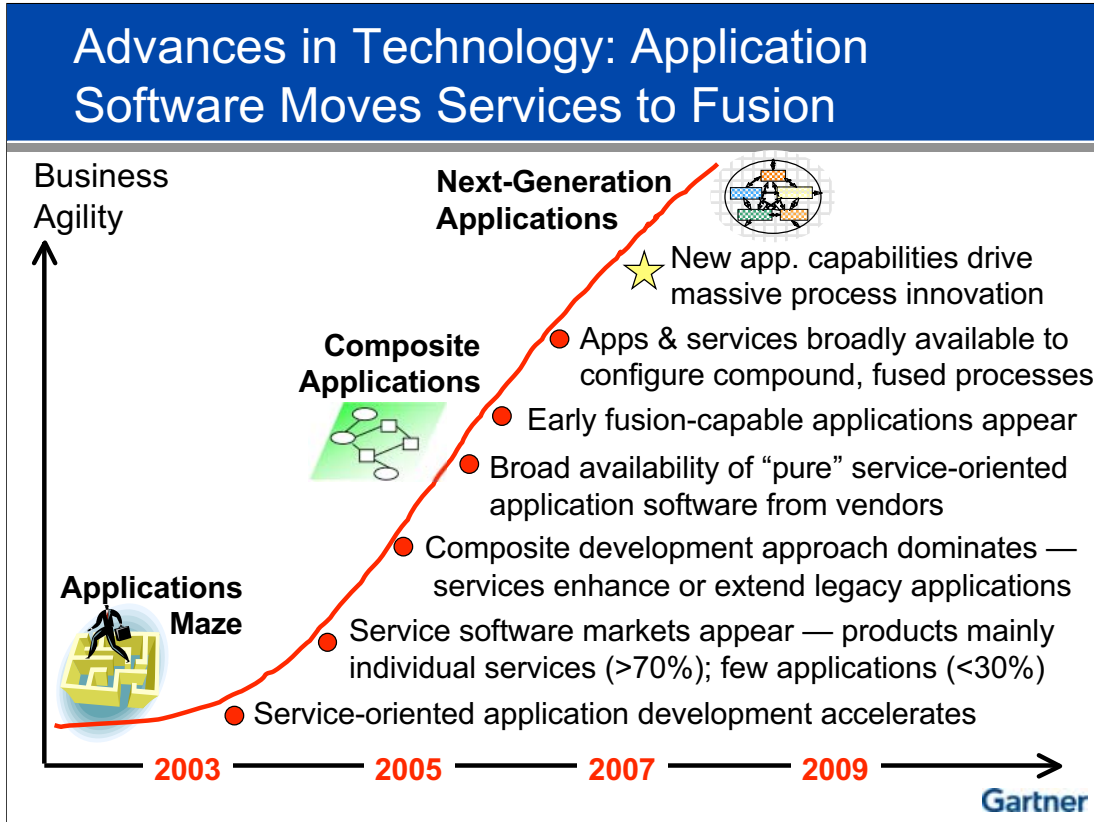
The image shows a hand holding a flexible, curved display device. The display is white and shows text in a vertical orientation. The text is a news article snippet about E Ink Corporation's development of electronic ink technology for paper-like displays. The text is rotated 90 degrees clockwise. The Gartner logo is visible in the bottom right corner of the slide.

Source: Gartner Research and E Ink

Client Issue: Which technology advances will dominate the IT landscape through 2009?

The next generation of mobile device form factors featuring long battery life and significant improvements over today's display technologies will be commercially viable starting around 2006. Specific vertical industries and functions will be deployed initially, followed by widespread deployment starting around 2007 to 2008.

Strategic Imperative: By 2006, enterprises must have adapted their architecture and infrastructure to aggressively begin deploying composite applications. Enterprises lacking these capabilities will operate at a distinct competitive disadvantage.

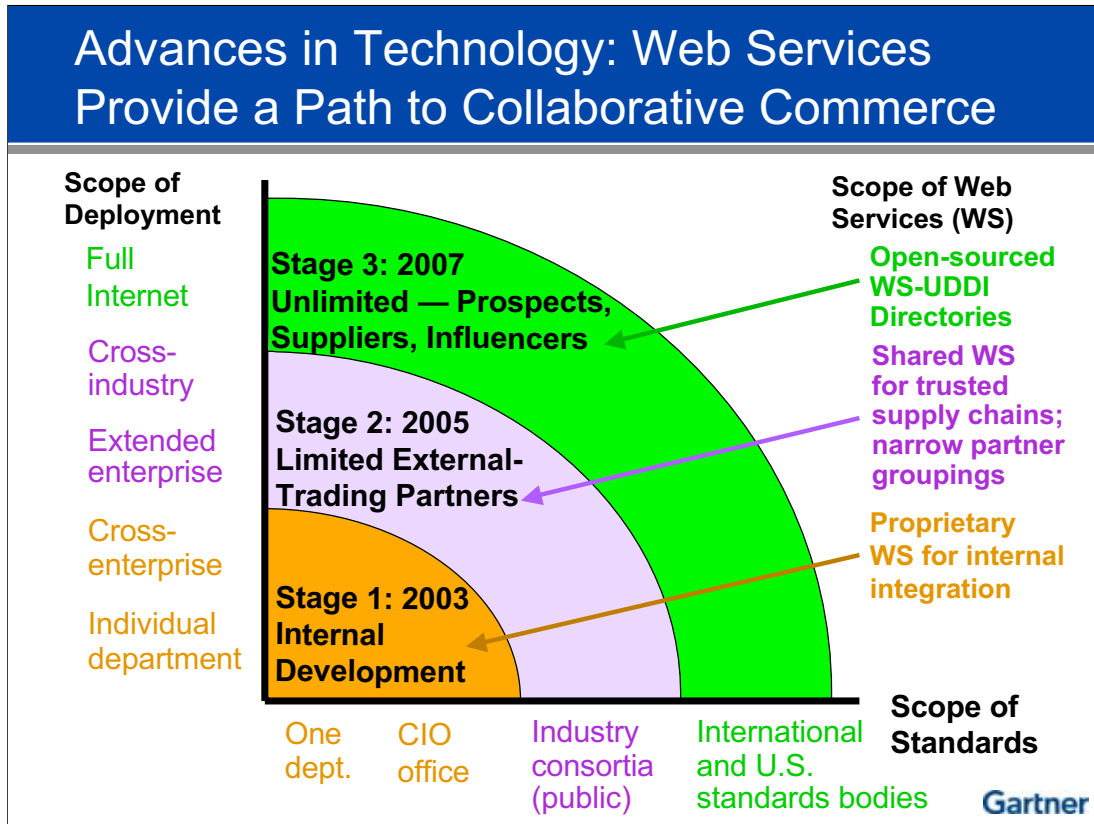


In 2004, we are seeing the origins of a new generation of application software. By 2007, most enterprises will have adopted new application styles into some business operations. Two features characterize these next-generation applications: 1) a service-oriented architecture (SOA), and 2) the fusion of processes that are “naturally” linked; that is, enterprises require an end-to-end view and integration across these processes.

The evolution of application software from 2004 to 2008 can be described from two perspectives:

- Technology adoption or how SOA and fusion principles are used to provision (that is, build or acquire) applications software and business services. User and vendor enterprises must integrate these principles into three aspects of their technical environment: architecture, infrastructure and applications software.
- Business use adoption or how processes are designed to take advantage of technology advances. Type A (technology driven), Type B (moderate technology adopter) and Type C (technologically risk-averse) enterprises will each adopt the next-generation applications at a different pace. By YE04, expect that most Type A enterprises will move quickly to adopt the technology, including implementing early service-oriented application styles (purchased or in-house developed). Type B enterprises will begin to refocus their architecture and rebuild infrastructure by YE04; they will wait for wide availability and stability of new applications and will not actively begin implementation before 2005 to 2006. Type C enterprises will wait until next-generation approaches are proven and mainstream. However, by 2006, most Type C enterprises will adapt their architectures and infrastructures to begin implementing these new applications.

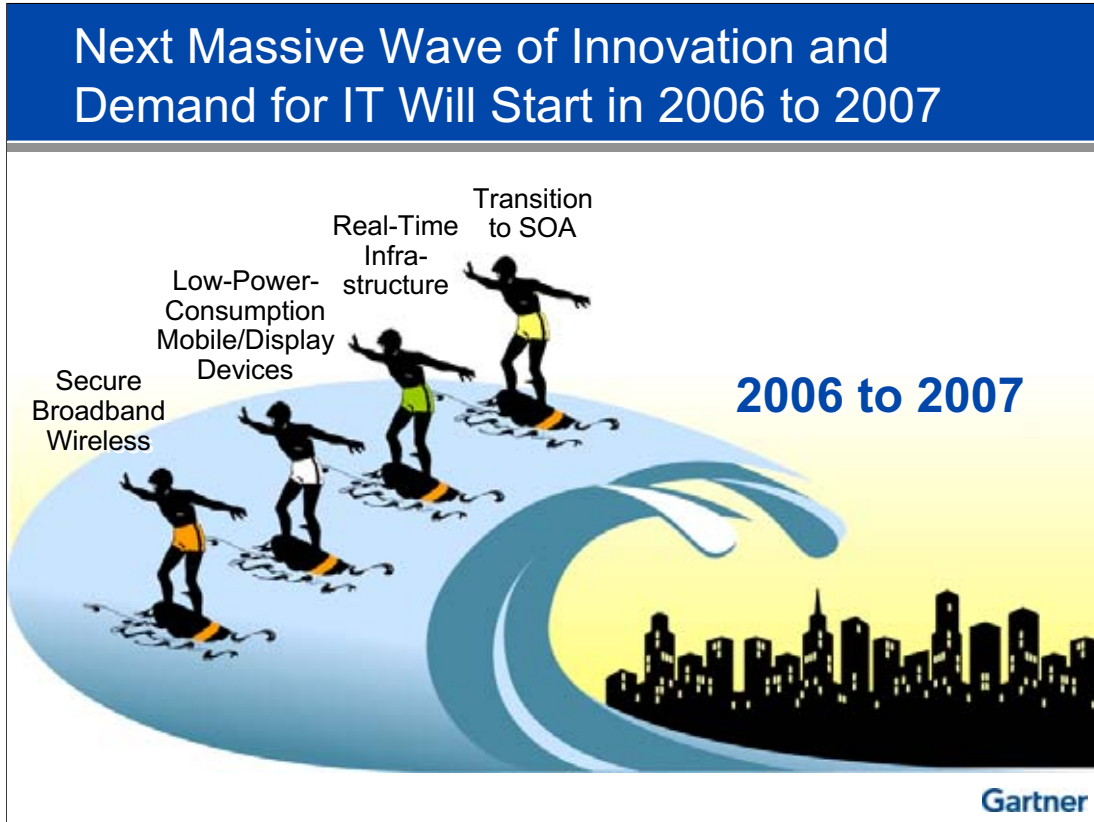
Strategic Planning Assumption: By 2005, enterprises sharing information across process boundaries will favor service interfaces over data interfaces (0.8 probability).



Collaborative commerce (c-commerce) is an unfolding, expansive model for business applications. It is driven by e-business demands and opportunities, and is enabled by Internet and service-oriented technologies. C-commerce is the most-advanced form of e-business in that it achieves dynamic collaboration among and between an enterprise's employees, business partners and customers. In c-commerce, enterprises harness the full power of the Internet by extending business relationships beyond rigid value chains and simple information sharing. C-commerce includes interenterprise Internet connections and goes a step further by enabling multiple enterprises to work interactively, often by dynamically restructuring their relationships in near real time. C-commerce will be enabled by Web services (functional units of application software made available through the Internet for use by other software systems). Enterprises planning for c-commerce should prepare for three stages of Web services. Stage 1, internal — Proprietary Web services will be used for internal integration and building electronic trading hubs. Some Type A companies deployed Stage 1 Web services in 2003. Stage 2, between trusted parties — By 2005, Type A companies will deploy Stage 2 Web services with known trading partners. Initial applications will be in SCM, logistics and shared development. Stage 3, on the open market worldwide — Enterprises will use online Web services directories to locate and connect new customers, suppliers or potential trading partners. Type A companies will deploy these services by 2007, dependent on the progression of the UDDI standard and other online resource locators, such as Universal Commercial Code and RosettaNet. *Action Item: Educate IT and business process developers on c-commerce and Web services concepts.*

Gartner Predicts: The Future of IT

Client Issue: How will the confluence of market forces, end-user behaviors and technology advances affect IT and society through 2009?



True individual technology breakthroughs are few and far between. The microprocessor was one, and the relational database was another. Most surprising changes in the industry result from the confluence of several technology advances that, when put together, create whole new platforms for innovation and growth.

We can see the new platform, as shown above. The shift is inevitable. We believe that it will start in 2006 and that the ramifications will be tremendous. Please bear in mind that 2006 to 2007 is the “trigger” time frame, where advanced organizations will begin to exploit this next wave; mainstream acceptance will inevitably lag by several years.

By 2007 ...

- It will be difficult to buy a nonwireless “device.”
- Secure, robust, national wireless broadband networks will reach critical mass.
- It will be nearly impossible to buy a cell phone without a camera.
- E-ink displays will be a viable alternative to paper, for many industrial and some consumer applications.
- Applications will be built by assembling services.
- Core infrastructures of computing and storage will be more autonomic and reliable.
- RFID is merely the precursor to smart objects.
- The last new application for Unix will have been written.
- The wireless digital media center will be the de facto home form factor.

Gartner

Client Issue: How will the confluence of market forces, end-user behaviors and technology advances affect IT and society through 2009?

Each of these examples will individually trigger niche (but important) new applications. However, what's more exciting is that they all will be commercially viable within the same time frame.

Strategic Planning Assumption: By 2006 to 2007, entirely new skill sets will be highly valued; many existing ones will be irrelevant (0.8 probability).

This Next Wave of Technology Will Cause Massive Disruption in the IT Workforce

- A robust, reliable and high-capacity infrastructure will demand entirely new skill sets.
- SOBA and SODA will demand major changes in system design and programming skill sets.

Extremely High-Value Technologies

Broadband	Wireless
Linux	Content management
Real-time analytics	Data mining
Security	Middleware
Certification	

Gartner

Client Issue: How will the confluence of market forces, end-user behaviors and technology advances affect IT and society through 2009?

One of the unfortunate side effects of these new technology platforms and architectures is the elimination of tens of thousands of high-paying IT jobs, whose primary function is to employ smart, highly paid workers to make up for deficiencies in the current technology generation.

Outsourcing doesn't solve core problems, it merely shifts them to another entity. This critical issue will be finally and permanently solved at certain levels when the technology becomes "good enough."

On the other hand, the skills needed to support this new environment will be highly valued. Start upgrading your organization's skills and start thinking now, before it's too late. The good news is that this new environment will be highly valued, and it will reward the people and organizations that can exploit it. Work toward mastering the sectors shown above.

Strategic Planning Assumption: Significant societal upheavals will occur due to the next technology wave (0.7 probability).

This Next Wave of Technology Will Cause Massive Worldwide Upheaval in Societies

- Real productivity gains will be achieved via workforce reductions
- Replacement or reduction of entire industries
- Creation of totally new industries, as well
- Live video around the world
- No longer “seeing is believing”
- No safe havens for the majority of white-collar job functions worldwide

Gartner

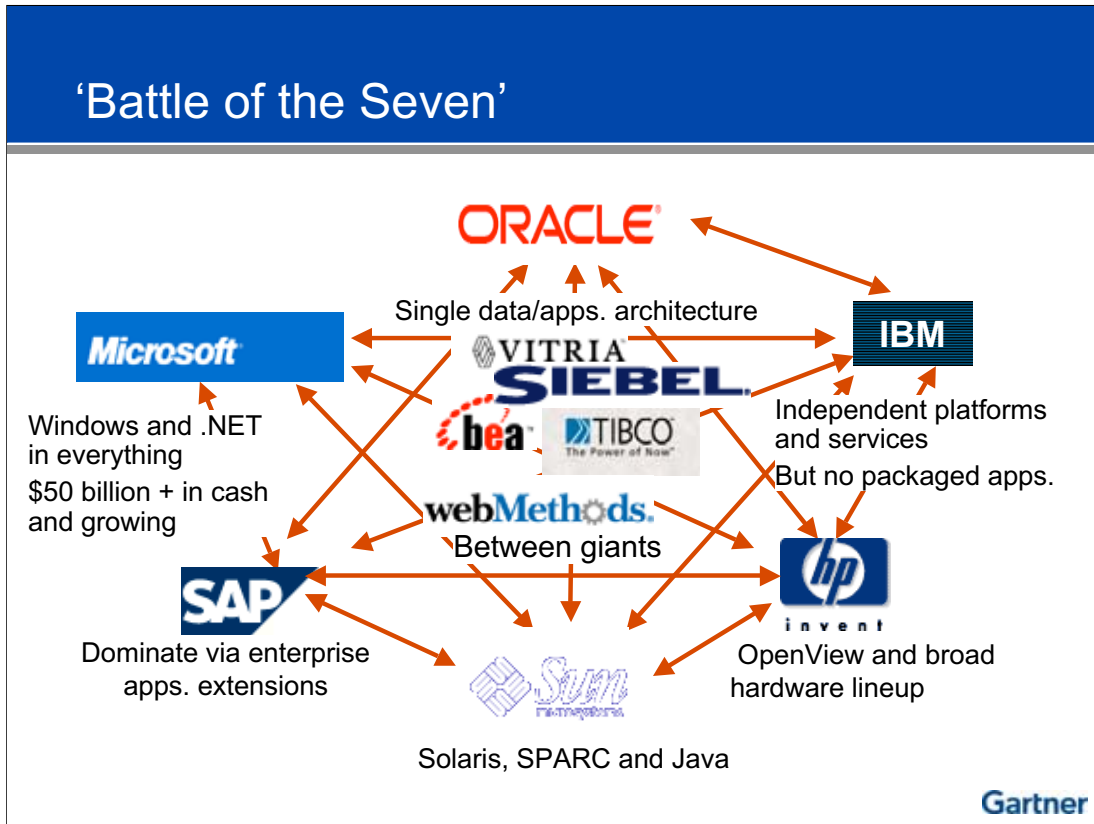
Client Issue: How will the confluence of market forces, end-user behaviors and technology advances affect IT and society through 2009?

Technology displacing human workers is nothing new. What is new, however, is the magnitude of this force and its resulting impact in the near future. The demise or diminishing of traditional industries also will be inevitable consequences. The uproar over outsourcing will be matched by the impact of these new technologies.

However, entirely new industries and wealth will be created. The way that these new technologies will be used will vary wildly. For example, an insurance adjuster will use real-time video one way, while terrorists will use it another way. China will react differently than Canada. The permutations and combinations are so complex that we don't know where they will lead.

The only certainty is that this technology wave will hit, and the rate of change for entire industries will accelerate. For example, what has happened to the music industry is nothing compared to what will happen to the pharmaceutical, news reporting, broadcasting, media, advertising, retail, transport, logistics and financial services industries, to name a few.

Strategic Planning Assumption: Acquisition of independent vendors by the major vendors will accelerate dramatically through 2005 (0.8 probability).



Client Issue: How will the confluence of market forces, end-user behaviors and technology advances affect IT and society through 2009?


The graphic depicts the framework that will control enterprise computing in the decades to come. The winner(s) will own a franchise more valuable than Windows.

(All the vendors in the middle are the seventh!)

Client Issue: Who will be selling the winning technologies through 2009?

Short-Term Conclusions and Recommendations

- Massive vendor consolidation is inevitable.
- Power will shift back to the vendors in many sectors.
- Desperate vendors will do desperate things in the next several quarters.
- Overall demand will see good single-digit growth in 2004 and 2005, but there will be huge variations between and within individual sectors.
- Design architectures and strategies based on the fundamental and inevitable confluence of:
 - Real-time infrastructure
 - Wireless broadband
 - Low-cost, low-power-consumption mobile devices
 - SOA
- Pick products and services accordingly (think like a vendor).
- Upgrade your skills to support the new platform and win.



The future is exceptionally bright for organizations that embrace these dramatic shifts. However, it will be dim for those that don't.

The shifts will happen for you or to you. The choice is yours, but time is short.

Long-Term Conclusions and Recommendations

- Design architectures and strategies based on the fundamental and inevitable confluence of:
 - Real-time infrastructure
 - Wireless broadband
 - Low-cost, low-power-consumption mobile devices
 - SOA
- Results in massive improvements in productivity.
- Demands changes in core skill sets.
- Creates next huge wave of innovation.
- Creates massive societal disruption.
- Creates massive potential to solve problems that we can't envision tackling today.
- Trigger year is 2006 — future will be terrific for those that upgrade their skills now.

Gartner