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THE NEXT BIG THING

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Insights and Foresights in High Technology for the Venture Capital Industry

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Top Ten Technology Trends for 2005 *We've investigated a wide range of promising candidates for next big things with an eye for calling the ones that might shake things up this coming year, in order to submit to you the Ten Technology Trends that we are betting will shape the year to come.* pages 1-15

And the Top Ten are...

1. There's no place like... the Digital Home
2. The Real Time Enterprise
3. My Cellphone, My Self
4. Peace, Love and VoIP
5. No Phishing Zone
6. Big Bang in Biotech
7. Wireless Everything, Everywhere
8. Citizen Everybody
9. Slouching toward Nanotech
10. Small Planet Blues

Seven Social Trends to Watch for in 2005 *Trends will reflect consumer behavior – so watching social trends can help manufacturers to develop more desirable products, and understand how best to market them. With this in mind, we've formulated these consumer trends for the high tech sector, to remind you that "It's the customer, stupid!"* page 16

Five Hot Products to Watch for in 2005 *These five new product concepts and trends may not all succeed, but they're definitely worth watching for.* page 18

The Top Ten Technology Trends for 2005

There's a saying that lovers of the law and sausage should never watch either being made. To these we'd like to add the business of predicting technology trends. It's a messy business, and one perfectly reasonable statement, like "we'll have infinite bandwidth in a decade's time" as stated by Bill Gates in 1992, will probably haunt you for a lifetime. Yes, it's a thankless job, but *somebody's* gotta do it.

To achieve the lofty goal of not sucking at the art of trend detection, we've investigated a wide range of promising candidates for next big things – everything from *atomic layer deposition* to *Zigbee* – with an eye for calling the ones that might shake things up this coming year. We've also looked deeper into existing trends – like VoIP and the Digital Home – to predict new and surprising ways in which they'll be implemented. We looked for technologies that not only make sense to the engineer or visionary, but also address the deep unarticulated needs of the customer. A similar process last year led us to declare that web services, mobile imaging, the China price, cyber-risk, VoIP, social networking, and a few others to be the major emerging trends. We have to admit that we were pretty good at calling the trends last year, in fact, right on the money. So where are we at this year?

Well, if you look at the recent upward trend in terms of venture capital investment in the United States:

US Venture Capital Investment ($B)	
2002	$3.7 billion
2003	$10.5 billion
2004	$15.0 billion

You'd say, yeah, a nice steady recovery. (However, when compared to dotcom era numbers, you'll see that it's nowhere near the peak of $106 billion invested in 2000!) But still it's an upward trend. More importantly, initial public offerings of 67 venture capital-funded U.S. companies raised $4.98 billion in 2004, more than tripling from the $1.41 billion raised in 22 deals during 2003. The 2004 result is the highest amount raised since the bubble years of 1999 and 2000, when venture-

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backed IPOs raised more than $19 billion each year. The number of mergers and acquisitions of U.S. venture-funded companies also improved year-on-year. In 2004, there were 376 mergers or acquisitions valued at $22.6 billion, the highest amount paid since 2000. During 2003, 335 companies merged or were acquired for a total amount of $12.9 billion.

Unfortunately, like his father's economy recovery before him, the Bush recovery is jobless in nature. Even with growing venture capital funding rate… Silicon Valley is still losing jobs. According to Silicon Valley employment statistics, there are an astounding 108,000 fewer jobs than before the dotcom boom. When Silicon Valley firms received billions of dollars in new venture funds in the late-90's, they immediately hired local talent. It is an inescapable fact that today's venture dollars are funding new jobs overseas.

Nevertheless, the bottom line is that the dotbust retrenchment has finally ended, and the underlying power of the Information Revolution is again beginning to build steam. Further, the release of the hobbles will result in a massive outbreak of pent up innovation, a technology tsunami that will wash out five years of hard times and bad memories. As painful as it was, the recession created a sadder but wiser and leaner but meaner venture capital industry that is going back to basics, and willing to do whatever it takes to bring innovation to market cost-effectively.

The trends we have detected for 2005 tell a story – a story of *hope* – that the best is yet to come. In the near future, the promise of the digital home will finally be realized, as the Internet and entertainment merge, allowing digital content to escape containment from the PC in the study. We believe that within a few years, wireless connectivity will be built into everything from digital cameras to coffee machines. (Kodak just announced a digital camera with wireless email built in.) Home robots will flourish – at first marveled, then ignored, then cursed for not being smart enough and constantly getting caught underfoot. (Then some enterprising developer will likely create socially adept robot interfaces that know how to apologize to us.) Cellphones will continue their long march to intelligent personal assistants, adding new bells and whistles like contactless payment and RFID readers to imaging, games and MP3 players. Over the next decade, VoIP will strangle Ma Bell. And after decades of failed ERP implementations, the Fortune 500 will finally get it right, as they adopt the philosophy of the customer-centric real-time enterprise. Even nanotech will start delivering a little on its enormous promise, proving that the future is what happens when you're making other plans.

The coolest thing about predicting technology trends is that it's really about daring to dream. It's about prophets of commerce who herald the entrepreneurial spirit that has propelled not just Silicon Valley, but the entire world over the past twenty years. It's the celebration of risk and reward, it's about the visualization of trends, it's about the triumph of the human spirit. Hey, we *love* to predict tech trends because it's inherently optimistic, about life will be a little more fun, more rewarding, more fulfilling. It's about seeing the glass not only as half full, but it's probably going to be delicious as well.

It's in this humble spirit that submit to you, our Dear Reader, the Ten Technology Trends that we are betting will shape the year to come. What's more, we're adding a couple of bonus predictions – Five Hot Products to Watch in 2005 and Seven Social Trends Driving High Tech.

Top Ten Technology Trends for 2005

1. There's no place like... the Digital Home
2. The Real Time Enterprise
3. My Cellphone, My Self
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1. There's no place like… the Digital Home

Walk the aisles of the Consumer Electronics Show, and you'll feel a little like Dorothy in Oz. It's loud, cacophonous, and feels very bit like Vegas. But click your heels three times, and you'll see that the entire high tech industry is trying to bring you back to the digital home. Microsoft announced that it will partner with TiVo to let consumers download movies and television shows onto DVD's and other portable devices. Apple has announced a new iPod that can download videos as well as music. And even the stodgy and bow-tied SBC got into the act, promising that it will not only wire 18 million households in 13 states with super-fast fiber optic connections, but it would also offer a set-top box that record and save TV programs, and can access music and photos stored on home computers. Owners will even be able to control their new set-top boxes remotely over the Internet! Now all we need are munchkins.

The Digital Home is likely to be the hottest consumer technology trend of 2005. The promise of the digital home – aka,

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couch potato heaven – is driven by the rapid spread of broadband Internet access across the world. Gartner Research estimates that by 2008, almost one in three homes worldwide will be connected to broadband Internet. Computer companies and consumer electronics makers are now fighting over the last meter, a winner-take-all battle to own the living room and to secure their devices at the end of the digital pipeline, delivering said couch potato with an mindboggling supply of TV shows, music, games, and movies.

Attempts at convergence started in the late 1970s, with several experiments in "interactive TV," beginning with the cable TV-based QUBE in Columbus, Ohio, in 1977. With the advent of videogames, convergence visionaries began in the mid-1990s to use the vertical blanking interval (VBI) to drive information to the TV viewer. Electronic program guides (EPGs) and nascent Internet-based interactivity, such as searching for sports scores and statistics while watching a game, became available. But these early trials were more "learning experiences" than profitable forays. In fact, Time Warner's Full Service Network vision was dubbed the Full Service Nightmare by the programming team tasked to deliver the vision with overpriced bleeding edge hardware.

But all that's over now. The convergence of the computer industry with the consumer electronics market has formally begun. Consider that Dell already has the highest market share in the $25-billion consumer electronics market, while Hewlett-Packard grabbed second place. More ominous for consumer electronics companies is the fact that Microsoft has successfully launched Windows XP Media Center. And on the consumer electronics side, Sony is kicking itself for not inventing the iPod and launching a successful online music distribution business. However, once you remember that it was the computer industry that gave us slow boot times, malfunctions, and needless complexity, you can see that the battle is far from over.

There are six components to this emerging trend and might indicate how the battle will fare: convergence of television with computing, transformation of distribution channels, growth of interactive advertising, wireless everywhere, P2P file sharing, and open standards.

First, let's consider the convergence of television with computing, which will let consumers share content and applications throughout the home. As homes get wired, consumer behavior will change drastically. Content sharing, device-agnostic applications, remote programming of DVRs, and a wave of consumer-created content are just some of the changes to expect.

The unavoidable impact of this is that the way we watch television will change. When television was invented, receivers were expensive, and it became something that was shared by the entire family. But today, there are many different kinds of television viewing. There's social TV, when you sit on a sofa and share a show with a friend, laughing together or crying together whenever appropriate. Then there's personal television, when you really would rather lie on the sofa and just zone out. The antithesis of being social. The HD big screen is great for watching movies and sports with the family or friends, but when you're looking forward to being a couch potato and enjoying your favorite guilty pleasure, this new kind of viewing will emerge, based on personal video tablets. The ergonomics of video tablets allows for a somewhat more immersive and personal experience, especially when viewing while reclining.

To tap this emerging market, Sony Electronics recently announced LocationFree™ TV, a portable broadband LCD television system. The LocationFree broadband TV will be available in 12.1-inch and 7-inch screen sizes, each with a Base Station. The Base Station transmits video content to its dedicated, wireless, touch panel screen. The base station houses an NTSC tuner, an Ethernet port for broadband compatibility and two video inputs for A/V components and other peripherals. The system is elegantly designed and is a first step toward this new way of watching television.

Another radical change is the profusion of digital video recorders in the living room and bedroom. Digital video recorders let viewers record TV shows onto hard disks, fast-forward through commercials and pause live broadcasts, and soon, will offer the new ability to transfer their recorded shows to PCs or laptops and take them on the road. Basically, content is moving out of the living room, where it can be controlled, rather than the computer P2P file sharing system, where it cannot.

The second component is that networking technology from the PC space is beginning to be designed into consumer electronic type products, to wirelessly connect your PC to your TV and stereo, or play MP3's that are on your computer through your home stereo… all through a wireless home network. The vision is to share and play back content freely through their homes, without notice of where that content actually is stored. An MP3 file can obviously be played on a PC, but why not on a highend hi-fi system in the living room as well? Or easily transferred to the smart phone/PDA to listen to on the train? Or the MP3 player to use at the gym? One major short term trend is that networking technology from the PC space is beginning to be designed into consumer electronic type products.

The third component to consider is the P2P file-sharing movement, which has allowed people to share millions of files – often copyright restricted –despite efforts by the entertainment industry to stop the practice. Using new p2p applications like BitTorrent and eDonkey, digitized movies and television shows are becoming the most requested downloads on networks around the world. CacheLogic, an Internet analyst in the U.K., estimates that BitTorrent accounts for an astounding 35 percent of all the traffic on the Internet. Again, the future can be predicted by looking at the Far East, where 58% of broadband-enabled Koreans download movies.

The most interesting part of the P2P story is that it's really about the emergence of new law, to smooth the integration of this new technology in society. Over the last year, the RIAA lost a landmark suit against Grokster which essentially legalized peer-to-peer file

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sharing, and it has yet to actually win against any of the thousands of individuals it has sued in court, making the group that drove Napster out of business into looking more like a pathetic bully who can't take a punch from the class nerd. However, the P2P soap opera just experienced its latest riveting plot twist, when the Supreme Court of the United States agreed to review the Ninth Circuit Court of Appeals decision that Grokster won over the RIAA.

Thus, the P2P industry continues to face an uncertain future, as the courts get a handle on digital piracy, so cautious investors will need to wait until this case is decided and pending copyright-related legislation is passed.

The fourth component is the impact of these new technologies on advertising. The people spending $60 billion on cable and television advertising are looking at the implications of Internet and electronic advertising. At the same time, paid search on the Web is booming, and people are starting to wonder whether this technology will eventually work its way into television advertising, as broadband, DVR, VOD, and HDTV further penetrate the market. This is an enormous undertaking, to transform mass market media into a number of systems that can manage one-to-one customer relationships.

Also, you have to remember that DVRs have turned the broadcast TV ad business on its head. In-Stat/MDR Research surveyed the market to find that over two thirds of those with a PVR skip ads, with 75% of those individuals skipping over 50% of ads shown. Thus, in the world of DVRs, ad executives are reallocating their ad budgets.

For example, instead of making a single ad, imagine if an ad agency could create a myriad of targetable 30 second stories, dynamically composed as a sequence of swappable components. Thus, hundreds or even thousands of different versions of any particular ad and send them to particular groups of viewers in order to optimize the response rate. Now, passive ads can be dynamically updated or modified automatically, just like a website. Would this increase the precision of marketing and lift response rates? Probably. Is the ROI there? Only time will tell.

The fifth component to consider is the power of open systems. Since no single player can possibly cover the entire value chain from technology to services, competitors are now building ecosystems to bring end-to-end solutions to this emerging market. The ultimate winners will likely be companies that adopt Internet-based platforms, open standards, and customer-friendly products, which could most likely mean startups with new ideas and innovative technologies, rather than corporate behemoths trying to hang onto their customers with content handcuffs.

The final component is the transformation of distribution channels and the entire media value chain, required to survive these significant shifts in the market infrastructure. Right now, distributors of content (Comcast, Verizon, Best Buy), content owners (Disney, Viacom, The New York Times), application providers (Yahoo!, Real, Microsoft, Google, Intuit), and device makers (Dell, Sony, Nokia, Palm) all enjoy a mature, stable and profitable value chain. All of that is about to be reshuffled.

Everyone is feeling nervous. Each layer has more competitors than ever before. Content producers are rethinking their options. Cable and telcos are stepping on each other's turf. Distributors like Comcast own their own content properties, siphoning eyeballs and advertising. PC makers like Dell are moving into the consumer electronics space. Time Warner is still trying to combine distribution, content, and apps. Apple is trying to gobble multiple layers of the value chain with its iTunes strategy. Even the lowly retailer, like Circuit City, will soon compete with cable and telcos to install and service the digital home. It's a mess out there.

And the opening salvo in the battle for the digital living room was fired at the Consumer Electronics Show, when it was announced that four cable television channels, including A&E and National Geographic will use the Internet to broadcast programs, in a deal with video-on-demand company Akimbo Systems. Privately held Akimbo sells a programing service and a television set-top box that uses high-speed Internet connections to gather and store TV shows. It can hold up to 200 hours of video.

With the Information Revolution's rise, dollars have flowed away from the device manufacturers – which is getting heavily commoditized – toward the new and compelling application layer. The distribution, content, and device layers are under attack, and the application layer – think TiVo fees, advertising dollars, Apple iTune fees, and mobile data service revenues – well, they're starting to look pretty enticing to investors.

Also, dollars are flowing away from content creators. Cable companies take money out of the pockets of content makers in many ways: VOD fees, increased sales of local advertising, and premium fees for their own channels (like local sports networks). At the same time, digital downloads are siphoning revenues from music publishers. And marketers are spending more time, energy, and dollars on new forms of marketing like search, email, and their own brand Web sites, moving away from traditional advertising.

These six forces will converge and change the way that the digital home will emerge and how television is consumed. More than likely, you'll be able to download whatever you want to watch – the sky's the limit – onto a home media storage system, and it'll all be ready to view in the order that you want. It's called 'queue and view'. You can watch it on any display you want – the HD wall display in the entertainment room, a work monitor in the den, or a digital tablets in the bedroom. These digital tablets will combine television viewing with VOIP, video conferencing, family appointment calendars that connect to everyone's smartphones, alarm clocks, … you name it.

Eventually, Hollywood will figure out P2P and leverage it. You'll be able to easily schedule, download, and rate TV shows and movies over personalized,

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one-to-one distribution systems that will enable a new renaissance in low budget filmmaking and citizen based reporting. Somehow, high precision advertising will be embedded into this new infrastructure for entertainment distribution. When this happens, not only will the revolution be televised, but the television will be the revolution.

And it's all just getting started. Home sweet digital home!

Inside Track: If you want a glimpse into the future, just look at tech-trendsetting Japan, where close to 50% of consumers user their computer LCD screen to watch television!

2. The Real Time Enterprise

The real time customer-centric enterprise. Man, what a mouthful. Anyway, this time, it isn't the KoolAid of desperate software vendors, it's the next evolution of enterprise software. Major enterprises have quietly started using web services to turn their business models upside down. By the end of 2005, close to 45 percent of U.S. companies will likely be using some form of web service, according to market research firm Gartner. Web services use the protocols that power the web to turn raw information into a kind of utility that can be repurposed in many forms. The promise is the ability to exchange data in ways that only blue-chip companies like GE or Cisco Systems have been able to do in the past, but without a bewildering array of heavy-duty protocols like electronic data interchange (EDI).

Web services have deep roots in the technologies that power the modern internet. The idea is to use the infrastructure built up to support the web to convey not just how a piece of data should be displayed, but what it means. This allows information to be torn apart and repackaged more easily for different purposes but disparate developers at different companies. Thus, the web services trend will likely gather momentum. The likes of Amazon, Google and Wells Fargo have started using web services with positive results. And as web services protocols mature, the technology will be able to handle more and more complex business processes, eventually supporting true dynamic collaboration between businesses. That will make it easier to outsource more and more complex tasks to outside companies.

Through 2006, Gartner predicts that service-oriented development will change the way software is built, packaged and sold by more than 80 percent of independent software vendors. Web services will provide a way to create applications as a set of services. The true power comes when standard business applications are built with this paradigm. Web services can be reused across applications and tuned to a specific business processes, extending and exploiting what enterprises have already paid for.

While identity, authentication and other security issues are still evolving for Web services, leading enterprises are already moving toward this new model of enterprise computing. By 2005, Gartner predicts, enterprises sharing information across process boundaries will favor service interfaces over data interfaces. However, more broad deployment of Web services will be dependent on the evolution of the UDDI standard and other resource locaters.

In addition to web services, there are a number of other enterprise software trends to watch out for, of which many leverage the web services infrastructure:

Utility computing is a model for delivering IT services that shifts risk from local IT to the vendor. Instead of choosing, owning and operating IT equipment, customers can buy the results of a system from a utility computing provider. Typically, the pricing model is based on usage, a pay-as-you-go licensing model that allows enterprises to meet peak usage needs without huge capital investments. Various hosting services today offer some form of utility computing pricing, with access provided through browsers and Web services. Gartner predicts that 30 percent of enterprises will adopt the utility computing model by 2007, up from 15 percent today.

Grid computing goes several steps beyond utility computing. It's a concept that certain vendors and startups have adopted as a key future initiative (i.e., it's still more hype than reality). Grid computing has grown out of scientific computing applications, which require massive amounts of horsepower to solve problems, such as weather simulation. A grid environment breaks applications in multiple parts that can be run on separate computers, rather than a single cluster, in parallel. Businesses are now looking to apply grid computing for commercial applications and utility computing. Gartner predicts that grid computing use within commercial enterprises will mostly be used for computationally intensive workloads, such as complex business and financial analytics. But don't expect rapid adoption, since standards for grid computing are still evolving and applications for parallelism will take time to evolve.

Mobile Enterprise Apps. The real time enterprise will also be wireless. To take a glimpse into the future, check out OpenTerra.com, a disruptive mobile middleware developer that produces mobile information management solutions for powering enterprise applications. Their mSolve solution enables businesses to deploy customized enterprise applications in as little as 24 hours. And using their mobile middleware tool gives enterprises instant security, extensibility, and robust user interfaces that run on virtually any wireless device, and across any communication protocols. By dramatically reducing the required investment, the ROI is increased exponentially, and deployment suddenly becomes a no-brainer. *[Please note the following editorial disclaimer: the publisher of this newsletter, Next Generation Ventures, holds an equity interest in this company.]*

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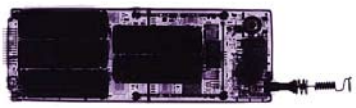
Network security convergence. Gartner predicts that 60 percent of firewall and intrusion detection functionality will be delivered via network security platforms by 2006. The major security vendors will create integrated suites of functionality, with unified management schemes, that address all aspects of securing an enterprise. Also, expect for content scanning and anti-spam to perhaps converge with network security, and for the development of network appliances for deployment of these services in smaller-scale environments.

Instant messaging is hot. Gartner predicts that by 2005, 60 percent of interpersonal data messaging by enterprise and consumers will be real-time, exploiting location and other presence indicators. Instant messaging has already inundated enterprises and a variety of handheld devices. However, there is still some heavy lifting to be done around security concerns, lack of an audit trail, quality of service limitations, integration issues and lack of support for non-text media. Expect to see a plethora of startups to offer solutions for these shortcomings: IM software that addresses security, auditing and integration issues. IBM is experimenting with an application called NotesBuddy, which integrates IM functionality with e-mail, making IM conversations searchable.

Taxonomies are a means of hierarchically categorizing information. Time and attention are in short supply, and decreasing the time required to search for information can lead to increased productivity and customer satisfaction. For example, e-mail content can be filtered by various preset criteria to improve on the text search currently provided. Customers looking for data about products will have a better experience if the data is properly tagged according to a well conceived taxonomy. Gartner expects that enterprise-level solutions that use taxonomies and profiling will become available for navigating all manner of content. So expect for CIO's to start talking about business vocabularies, dictionaries, glossaries and indexes necessary for useful taxonomies.

VoIP for business is slowly moving toward mainstream users, but the implementation of IP telephony infrastructure will take time, as many enterprises have to wait out the replacement cycles to remove older digital and analog phone systems. However, cost savings isn't the only factor driving adoption of IP telephony. In a ZDNet survey of over 400 IT professionals, respondents said in addition to cost savings, they were interested in capabilities like IP videoconferencing, call centers, and integrated collaboration suites.

RFID (radio frequency identification) will eventually evolve from a supply-chain technology into enablers of value-added consumer applications, such as item location and status, but it may take as long as a decade to achieve this vision. The primary milestone to look for is the declining costs for RFID tags to pass the five cent mark. Once that happens, deployment within the enterprise will become a no-brainer.



3. My Cellphone, My Self

In Japan, the cell phone is way past being just a phone, the cell phone is now considered "a way of life". Many young people in Japan even describe their cell phones as extensions of themselves. On subways and trains throughout Japan, you will see *keitai* addicts, oblivious to the world around them, their hyperactive thumbs furiously typing e-mails on cell phones, have become ubiquitous, even stereotypical sights. (The Japanese word for a cell phone is *keitai denwa,* literally "carry phone", and by dropping the *denwa,* the term *keitai* has passed into mass usage.)

One Tokyo TV station recently broadcast a reality show featuring a teenage girl whose cell phone was taken away for one week. She was reduced to tears when she finally got it back. Cell phones have created extensions of personal space in Japan, so people can take their world with them. In the keitai world, people forget where they are, and women can be seen putting on makeup or brushing their hair in the subway, something considered highly rude in Japan in the past. But now, people are walled inside their own little world with their keitai and aren't even aware of what they're doing in public.

Technologies considered experimental or novel in the United States have already gone mainstream here, giving rise to an unparalleled cell phone culture. Today, Japan offers a fascinating glimpse into a possible future for Americans: life in a wireless world through the cell phone. The mobilized Japanese keitai users are pulling out their phones to watch TV, navigate city streets with built-in GPS systems, download music, take and share home movies, scan barcoded information, get e-coupons for discounts on food and entertainment, pay bills, play Final Fantasy, even program karaoke machines through their phones.

Here's an interesting use for cellphones – students in more than 52 courses ranging from math to welfare studies at Bukkyo University almost never speak aloud. Rather, they e-mail questions and comments from their cell phones to their professors while in class, and professors answer orally. Also, cell phones have dramatically improved efficiency in marketing. Restaurants advertise immediate discounts on Web sites when they have a slow night, offering price cuts of as much as 15 percent to fill seats with keitai bargain hunters.

What does this mean for the rest of the world? This phenomenon we see in Japan today is likely to repeated throughout the world, as we move toward a global tipping point for a new kind of pervasive wireless client device. What is this new device? Perhaps like in Japan, the rest of the world will drop the 'phone' in mobile phone, and simply start calling these devices my mobile. Driving this trend will be the fact that so many radically new and imaginative innovations and applications will be added to the device, that you just can't call it a phone anymore.

Now, a short note about America. America has lumbered along like happy-go-lucky redneck on a John Deere tractor, while Japan has zoomed by in a souped

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up Supra on the wireless information superhighway. As America is just getting introduced to cameraphones, the Japanese consider mobile imaging so 2002. And as America is just starting to build out 3G networks, the Japanese are already planning 4G ones. In fact, the slang for declaring something unchic and behind the times, even Japanese products, is to label it "American". It's sad but true, America is falling behind.

Nevertheless, we believe that in the United States this new mobility trend will eventually lumber into a mainstream market, and what's more, cameraphones will lead this trend to this new ultimate mobile device. A new study from InfoTrends Research Group projects that worldwide sales of cameraphones will grow at an explosive rate of 55% to reach 800 million units in 2008, surpassing the personal computer as a platform for communication and computing. As new features are added, riding on the coattails of the mobile imaging revolution, expect much of what has happened in Japan to be replicated domestically. By this time, expect for Japan to already be onto the next big thing, perhaps moving to a full decade ahead of the United States.

One milestone indicator to look for is the digital bearer transaction. This is a payment system where a cryptographically secure value-object, issued and underwritten by a third party, is exchanged between the two parties in a trade, typically between two computers over the Internet. When this happens between two mobiles, watch out.

One interesting prediction for the next year comes from Mark Resch, CEO at Creative Commons, who reports that word on the street suggests that there is a 50% chance that over the next twelve months, Microsoft could emerge as a serious contender to become the dominant mobile handset OS player.

*Inside Track: To glimpse the future of mobile phones, try to make it to the **3GSM Congress,** to be held in Cannes in February. This is THE event that sets the agenda for the global mobile industry's future. Especially their VC forum!*

4. Peace, Love and VoIP

Voice over Internet Protocol (VoIP) lets you make free phone calls all over the world. If that isn't a revolution, what is? But if you think about it, you can email all over the world for free… why can't you talk to people for free as well? What's wrong with that? Wow, what a beautiful world? You can almost hear John Lennon singing, *"Imagine all the people, calling each other for free…"*

VoIP is hotter than a pistol, and residential VoIP will emerge as one of the most disruptive services in the telecom industry during this decade. Incumbent carriers have entered the residential market this year increasing the competitive pressure on cable companies and new entrants. It's forecasted that the number of VoIP subscribers worldwide will grow from 2.8 million in 2004 to 97 million in 2009. The US market will particularly benefit as it accounts for 30% of the broadband market by subscribers. Longer term, the Asia Pacific region will account for the largest share of VoIP subscribers.

On the policy front, a milestone has been met with the U.S. Federal Communications Commission voting that Vonage's VoIP phone service is "interstate" in nature, meaning that individual states cannot regulate Vonage as it would a traditional telephone company, nor regulate the rates, terms and conditions of Vonage's service. This decision is the kind of boost the VoIP sector has been looking for, and will for at-least some time prevent states and cities from meddling in the technology which has barely cracked the half-million mark. FCC voted 5-0 in favor of Vonage. As expected, we can expect this decision to be challenged by the states, who are seeking their pound of flesh.

FCC Chairman Michael Powell said, "The genius of the Internet is that it knows no boundaries. In cyberspace, distance is dead. The Order recognizes that several technical factors demonstrate that VoIP services are unquestionably interstate in nature. VoIP services are nomadic and presence-oriented, making identification of the end points of any given communications session completely impractical and, frankly, unwise."

To continue the analogy of VoIP as revolution, the Molotov cocktail for VoIP is Skype, the free VoIP system, which is has enjoyed 50 million downloads (resulting in about 19 million users) in under a year after its release. Skype is good software. It's easy to install and use, works through firewalls, and lives up to its simple claims of providing clear Internet voice communications to its users. As a result, the product is an unqualified success. In the high tech sector, it's the defacto standard for international business development executives, and it's become cool to print Skype addresses on business cards.

Economically, Skype's biggest advantage is that he doesn't have to spend money to acquire customers. Ordinary telephone companies spend as much $700 to land a customer, and even VoIP pioneer Vonage advertises like crazy. But Skype is growing faster than any other phone or VoIP service, and it's all happening by word of mouth, without a penny of advertising. But since Skype is free, where will the revenue come from? Is this another dotbomb in the making? Is Skype nothing but hype?

Well, we can rest easy. Skype has already one fee-based service on top of the core Skype functions. Over the short term, revenues will come via interconnecting with the standard telephone network, that is, by collecting from the termination charges associated with calling regular telephones. Called SkypeOut, Skype cemented a revenue stream by signing agreements with four carriers – Colt, iBasis, Level 3 and Teleglobe – to enable termination of internet calls on landline phones in most of the world. Over half a million users prepaid $13 to use the SkypeOut service. Other fee based services are coming. For example, voice mail could be an added feature for Skype. However, Niklas Zennström, co-founder of Skype, believes that ultimately, when voice becomes just another Internet application, people will stop paying for calls entirely, and the only way to generate revenues will be via additional services and selling VoIP hardware.

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So where is VoIP headed? Perhaps Skype will someday be the voice equivalent of Hotmail. Like Hotmail, it's free, but an enhanced model, free of advertising, can generate a subscription fee. As such, it VoIP needs to become a part of something bigger. Therefore, the real issue isn't whether VoIP is here to stay, but to figure out the revenue potential for the profusion of VoIP related services, add-on's and innovations that are coming. Thus, Skype is slowly evolving from an application into an infrastructure, as new technologies and innovations are accelerating the approach of the tipping point for VoIP itself.

For example, would you like to put Skype on your web page, perhaps send out e-mails with Skype presence, or create a workgroup or forum where presence information can be shared between people who are not on your buddy list? Well now you can. A company called Qzoxy is the first company to announce a Skype API solution. Qzoxy recently announced a toolkit which will enable the rapid integration of Skype functionality including presence and text messaging capabilities, into third party websites and applications.

The future is really about presence. With Qzoxy potentially thousands of different directories are possible. From Yellow Pages to matchmaking sites. Imagine if LinkedIn, Orkut and Ryze could enable interoperation with Skype. When work groups combine presence in a wiki, then we have something that could fuel group collaboration and workflow in a dramatically new way. Imagine Qzoxy/Skype as a plug-in for Outlook where you can click on a name to dial the VoIP phone, or in your mobile phone, enabling the ability to replicate your instant messaging experience in your voice calls. Imagine knowing the online-status indicators for sales or support staff, allowing customers to connect instantly. Imagine bloggers letting readers know when they're available for voice or text chat. Imagine customers from overseas no longer needing to spend money on expensive phone calls only to discover that you're sending all your calls to voicemail. The ability to broadcast your presence is a truly disruptive innovation for telephony. [Ed. note: we predicted this would be invented a year ago.]

Also, the WiFi market may soon get a boost from VoIP, when smart developers start adding VoIP services on top of WiFi. Paying ten bucks for a day pass at Starbucks will start looking like a great deal, when you get all the international long distance calls you want to make for free as part of the service offering.

What else can we say about VoIP? We'll paraphrase John Lennon:

You may say I'm a dreamer,
but I'm not the only one,
I hope some day you'll join us,
And the world will live as one.
- John Lennon

Inside Track: Check out Pulver Innovation's WiSIP phone, which puts Wi-Fi and VOIP into a single package for under $200. Next time you're at Starbucks you can make free calls all over the world!

5. No Phishing Zone

Phishing and methods for combating Internet fraud are emerging as a major trend for 2005. And if you haven't heard about it before, phishing is an Internet scam that relies on mass e-mail blasts luring people to Web sites that look just like their bank or favorite e-store. Once there, they unknowingly give financial information to crooks and criminals. In these scams, thieves build Web sites that sell everything from sporting goods to viagra at bargain-basement prices, and because it's the Web, those authentic pictures and descriptions of goods lifted from real online stores make it look like the real thing. But they aren't. The average phishing site usually has a lifespan of a few hours to three days before banks and Internet service providers locate and foil them.

Fraud experts say phishers also are finetuning their scams in what is being called spear phishing. Such scams might target eBay customers, mainly because buyers and sellers are accustomed to receiving certain types of e-mails, and not arouse suspicion. For example, scammers might replicate eBay's "contact member" form to ask questions of people who have placed bids on a high-priced item, collecting e-mail addresses from bidders who respond to the questions. Days after the auction ends, the bidders receive e-mail messages from someone pretending to be the seller, explaining that the winning bidder backed out and offering them a second chance. A variation involves sending fake eBay invoices via e-mail to winning bidders shortly after the end of an auction.

Some phishing victims find that criminals are maintaining databases of more gullible marks, just as telemarketing companies do. If you fall for a PayPal phishing attack, you'll get placed on some idiot list somewhere out there and the deluge of fraudulent offers begins. Such constant attacks could result in a Chernobyl effect for phishing, as it propels certain people to give up on e-commerce entirely.

Websense, a San Diego-based company that offers online content blocking services for businesses, found that there are between 800 and 1,100 fraudulent and phishing Web sites online at any time, and slightly more than half of those are pure fraud sites. Security software maker Symantec estimates that phishing-related e-mails have doubled in the last few months. Unlike spam, which is an annoyance but isn't quite as malicious, phishing is the next generation of identity theft. The Federal Trade Commission estimates that 1.8 million people have been victims of so-called phishing scams, over the last year.

To combat this trend, the U.S. federal government is now setting up a massive, near-real-time database into which several major ISPs, financial services firms and e-commerce companies are to place their data to help fight crime, particularly phishing attacks. The Internet Crime Complaint Center (IC3), dubbed *Digital PhishNet,* will house the effort, and will include data from Microsoft, AOL, Earthlink, Lycos, Network Solutions and Verisign. Almost all of the top ten banks are also participating, though they decline to be named publicly.

PhishNet is the brainchild of Stirling McBride, a fraud investigator with Microsoft. His brainstorm was simple

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– share information about phishers among legitimate e-commerce businesses so they can collectively shut down a fraud site as fast as possible, collect information about who's running it, and send the info on to authorities. It's like P2P for law enforcement. Sounds simple, but it's really a major change from what the industry has been doing. Companies like Earthlink, Lycos, and eBay were trying to beat back phishers on their own, and not really having too much luck at it. VeriSign was trying to shut down phishing sites as soon as they were discovered. And Microsoft was scouring the Net and routinely forwarding leads to the FBI's Internet Crime Complaint division. But because they weren't working together, the trend of phishing kept growing.

If PhishNet works, it'll put a major dent in phishing scams by allowing investigators to focus on the biggest cons. And it will help the FBI compile more comprehensive files for prosecutors when they catch someone and bring them to trial. Ultimately, that could lead to more convictions.

But will PhishNet be enough? Probably not. First of all, many of these scams are being run from outside the U.S., often in countries where no laws govern them. But it's a start. Also, the alliances allows the kind of coordination required to respond quickly to criminal innovation by the cyberscammers.

Furthermore, spam is still a problem. A recent VeriSign report found that bulk e-mail, or spam, accounted for nearly 80 percent of all messages handled by its clients. 11 billion spam messages were sent daily in 2004 across North America, and even with 60% of American email users installing anti-spam solution, it's estimated that spam will grow to 12 billion spam messages per day in 2005.

The cost of spam is significant. The global plague of spam, combined with tighter email retention policies dictated by government and industry, is severely increasing storage costs. According to analyst IDC, the dramatically increasing cost of storing and managing email throughout its life-cycle is driving the need for better management of email-based collaboration and content. Last year the size of business email volumes sent annually worldwide exceeded one exabyte (one billion gigabytes) for the first time, much of this consumed by useless spam. Furthermore, spam is frequently the point of entry for viruses, and other IT headaches, and users often struggle to keep up with mail overload, regulatory compliance and inbox management.

This mounting pressure of fraud and security concerns is leading to a sharp growth in spending on identity and access management products in 2005. According to the Radicati Group, the identity management market will finish this year at $738 million worldwide, and rocket up to $10.2 billion by 2008.

Experts say that most of the growth will come not from futuristic authentication methods like as fingerprint scanners and earlobe recognition, but from simplifying the authentication process for users across different systems and applications. Large companies are just coming to grips with the cost of routine tasks such as tracking passwords. According to a recent Meta Group study, companies with more than $500 million in annual revenue have more than 75 applications that require some sort of authentication. So when users have password problems, they call the help desk. Problems with employee identification and access represent 15 to 35 percent of all help desk calls, according to Gartner estimates. With each call costing between $10 and $31, simpler identity and access management across the enterprise could produce significant savings.

Thus, vendors have snapped up identity technology since 2002 with the aim of owning a piece of the growing market. In November 2002, IBM bought Access360 to strengthen its Tivoli Identity Manager. One year later, Sun Microsystems picked up WaveSet Technologies. Hewlett-Packard spent $13.8 million for SelectAccess in July 2003, and bought TruLogica for an undisclosed amount in March of this year. In October, Computer Associates bought Netegrity for $430 million.

The new threats are actually opportunities, because the future of the inbox requires a dramatic improvement in security and flexibility without sacrificing its usefulness. The winners in the corporate identity sweepstakes will be new ventures and vendoes who harness the power of the Internet to simplify access to many applications in large organizations. Gartner estimates that 60 percent of enterprise customers will buy software that helps them manage access either through a web portal or across separate corporate networks. For example, Oblix may be one of those integration artists. The company has taken advantage of standards such as the Security Assertion Markup Language (SAML) - a protocol similar to HTTP that facilitates communication between servers and management programs - to build a web-based interface for its identity and access management offerings. Oblix acquired Confluent, a web services management vendor, in February of this year to help meet its web portal objectives.

Also, as corporate governance regulations tighten, access management policies will have to be auditable. Systems administrators will prefer software that tracks changes as they are made and records who gets access to what data. Executives will face regulatory incentives to support software acquisition that complies with necessary audit trail standards.

Ultimately, every company in the world will need to address these problems, and the solution for these ills is a major new market in the making.

6. Big Bang in Biotech

After years of heavy investment by drug companies, and massive research collaborations like the Human Genome Project, biotech is now starting a big bang in terms of discovery, invention and ROI. In each of the last five years, biotech researchers have averaged more than 7,500 biotech patents, according to the Biotechnology Industry Organization (BIO), more than double the annual average from the previous eight years. So far, 155 biotech medicines and vaccines have been brought to the market

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in the last decade, and two-thirds have made it to pharmacists' shelves in the last three years, showing an acceleration in the rate of discovery. Economically speaking, six biotech drugs have hit the $1 billion mark. Despite price tags that can zoom past $10,000 for an annual dosage, new biotech drugs for arthritis and other ailments have seen waiting lists develop.

The stage is set for an even bigger bang, based on a new technology called RNA interference, or RNAi. Simply put, RNAi is a natural process in cells that researchers can harness to deactivate selected genes. It sparks intense excitement for two reasons: first, RNAi within a few years should yield a rough idea of what each of our genes does – knowledge that until recently seemed decades away. Second, it promises novel drugs that literaaly disable genes that cause disease. This is a Holy Grail for biotech scientists, the equivalent of a guided missile into the heart of the disease.

Advances that win Nobel prizes don't come along every day. In biotech there have two golden days like these, both in the 1970s. One marked the advent of gene splicing, which enabled genes to be implanted in cells to churn out medicines like EPO, the anti-anemia blockbuster that helped make Amgen a $5.5-billion-a-year giant. The other came with the development of monoclonal antibodies, molecules that single out diseased tissues for destruction – Genentech, the grandfather of biotech – gets most of its $2.2 billion a year in sales from monoclonals. RNAi looks like it's the next golden day.

What triggered the new gold rush was an article, in the respected Drug Researcher journal, that reported about how a novel RNAi treatment cured a disease similar to Huntington's disease in mice, an inherited neurodegenerative disease. This was the first example of targeted gene silencing of a disease gene in the brains of live animals and the article suggested that this approach could eventually be useful for human therapies. An additional finding by the researchers was that RNA interference in and of itself does not appear to be toxic to normal brain cells.

The successful delivery method of the RNAi via a viral vector (a stripped-down virus) was used to deliver small interfering RNA (siRNA) fragments to critical brain cells of mice with a disorder that mimics the human neurodegenerative disease spinocerebellar ataxia 1. The siRNA material was designed to bind to and suppress the disease-causing SCA1 gene. Mice with the SCA1 gene that were treated with the gene therapy had normal movement and coordination and their brain cells were protected from destruction. The active treatment also prevented the build up of protein clumps within the cells, a marker for cellular dysfunction. Meanwhile, SCA1 mice that were not treated developed movement problems and lost brain cells in a manner similar to humans with this condition. Both SCA1 and Huntingdon's are inherited diseases caused by a particular type of genetic flaw in which a single mutated gene inherited from either parent produces a protein that is toxic to cells. Any successful therapy must remove or suppress the disease-gene as opposed to simply adding a corrected version. The marriage of viral vectors with RNA interference seemed to do the trick.

RNA interference thus provides the foundation for a treatment against other neurological degenerative diseases caused by neurotoxic proteins, such as Alzheimer's disease. Currently there is no cure for Huntington's disease and treatment options are generally aimed at controlling symptoms. This is the first time that a full blown cure seemed achievable.

So RNAi appears to be the biggest new trend in the biotech arena. Additionally, we expect a few other trends to happen:

- Drug companies will continue to outsource discovery programs to China, India, and Singapore.

- The line between IT and drug discovery will continue to blur as computational biology is simply woven into the fabric of all biology, especially as we see aging pharmascience veterans retire.

- Drug companies will curse Eliot Spitzer as they scramble to comply with a growing list of regulatory mandates and meet deadlines. Sarbanes-Oxley and the growth of lawsuits by states' attorney generals will drive a new market for compliance software.

- P*harmacovigilance.* This is the hot new buzzword for the next year, thanks to the Vioxx withdrawal and suspicion over other blockbuster drugs. Pharmacovigilance is the PR/marketing ploy that spins the release of negative trial data to actually seem like a positive in the eyes of the market. So even though nobody really knows what it is exactly, the FDA will want it, regulators will demand it, and everyone will struggle to build it. Thus, it's a major opportunity space for vendors who can integrate software, content, and services to manage toxicogenomics, adverse event reporting, and regulatory compliance. The first vendor to offer a comprehensive solution, will own the space.

7. Wireless Everything, Everywhere

At the Consumer Electronics Show, Eastman Kodak unveiled a high-end digital camera that can e-mail pictures using WiFi technology. Kodak's Ofoto service for Internet photo printing will be accessible wirelessly from the new device. The new camera will also be able to view photos stored on Ofoto. This is evidence of a trend we call Wireless Everything, that is the complement of another trend we call Wireless Everywhere. It's estimated that by 2006, there will be close to 100,000 public Wi-Fi network access points and 100 million Wi-Fi users worldwide. This has convinced every major technology player, including IBM, Intel, Cisco, Apple, HP and Dell, to invest billions into the unstoppable wireless trend.

At last count, 113 3G networks have been deployed worldwide. But even before we've fully built out 3G, carriers and mobile phone manufacturers, including NTT DoCoMo, Cingular, Siemens and Vodafone, have joined forces to begin developing the next generation of high-speed networks. The technology – known only as Super 3G for the time being – will be more than 10 times quicker than current 3G

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services. DoCoMo said the first stage of development will be completed by 2007, but no date has been set for a commercial launch. Existing 3G infrastructure, which has cost phone companies billions in recent years, will need to be upgraded but not replaced.

Entire cities are planning to build out ubiquitous wireless networks. Consider for example, Philadelphia, the city of brotherly love, or Santa Clara, in the heart of Silicon Valley. All the city has to do is lease space on its light poles, and private vendors like MetroFi are willing the foot the bill to unwire the city. The resulting network will be comparable to DSL and cost residents $19.95 a month for a 1-megabit connection.

At the same time, new wireless standards are driving throughput. WiMAX and other emerging high-speed wireless technologies will capture more than 40% of the wireless broadband business over the next few years, leaving 3G with less than 60% of the market in 2009, according to TelecomView. WiMAX will pick up 70% of this high-speed wireless segment by 2009 due to its higher performance and flexibility compared to the alternatives, not including the ability to do VoIP calls for free. 3G will be important for its mobility, but WiMAX will then directly compete with DSL.

Here are some of the developments we expect to happen, as the Long March to an Unwired Planet continues:

First, expect to see devices that operate over heterogeneous communications protocols. In other words, expect phones and PDAs to start by bridging cellular and WiFi networks. But this will be a rough road, as carriers will usually try, at first, to protect their networks and investments in technologies by refusing to let other carriers' customers on their networks. Thus, WiFi roaming will be blocked whenever possible.

Second, the search for the killer app is going to be abandoned, especially in such a highly segmented market as wireless presents. Plain-vanilla voice represents about 95 percent of wireless carrier revenue, but it has become commoditized. So expect to see a flurry of tiered, premium voice services, including cellular conferencing, group voice messaging and whatever else they can come up with.

Third, 2005 is the year when enterprise CIOs finally begin to mobilize their organizations as device and network performance meet expectations and compelling enterprise wireless applications emerge. Corporations will move big blocks of employee phone numbers to the carrier that best meets their budget and mobility needs, and will demand quality of service SLAs in return. Eventually, VoIP will support delivery of all voice services, whether the subscriber is at home, on the move or at the office.

Fourth, high-performance phones and increased network throughput speeds will support a multimedia content. A new battleground is emerging over who controls the value of this content, and carriers will have to fend off non-traditional players. Expect interesting partnerships, like Apple and Motorola teaming up to deliver music content to iPods, and Club Nokia encouraging handset owners to sign up for exclusive offers and cool content, sent directly to phones, without caring who the carrier is.

Finally, the wireless industry will continue to work aggressively to protect subscribers from handset spam. That luck can't last forever, as spammers figure out how to invade wireless networks with unsolicited location based ads. Wireless carriers will count with spam-busting technologies and policies that could ultimately help clear the way for permission-based, mobile marketing by major brands.

On the other hand, the wireless revolution may not be entirely bloodless. For example, a recent poll by Unstrung revealed that unless tariffs are reduced and coverage areas expanded, most respondents believe that WiFi hotspots won't reach critical mass and will wither and fade like an unloved old maid. Twenty-eight percent of those surveyed said public access hotspots will never make any signficant money, and that 802.11 technology should be left to the enterprise market. On the other hand, 26 percent surveyed said that hotspots will take off, and that it's only a matter of time before the hotspot wave has mass appeal. The most favored enabler for critical mass takeoff is "increased coverage areas and the emergence of 'metro-zone' 802.11 networks"

Inside Track: To see a dizzying assortment of wireless devices, without having to fly to Tokyo's Akibhara electronics district, check out www.dynamism.com, which offers gaijin like us access to stuff like the NEC N900, a credit card sized GSM phone, the Campho Advance that turns the Gameboy into a handheld video conferencing station, and some truly stunning laptops you'll never find at CompUSA.

8. Citizen Everybody

Readership of online blogs grew significantly in 2004, driven by increased awareness of them during the presidential campaign and other major news events, according to a survey by the Pew Internet and American Life Project. Twenty-seven percent of online adults in the United States said in November they read blogs, compared with 17 percent in a February survey.

The recent tsunami in Southeast Asia was so widely distributed geographically, that it really needed an army of reporters to comprehensively journal such a devastating global event. Because first-person narratives and photos from the affected areas were often much more compelling that the traditional news sources, a blog is often more raw and immediate than network news coverage. Thus, by providing a less polished and more intimate voice, the typical blogger can be more effective than an expensively coiffed newscaster in sympathizing with victims and understanding the impact of such events. Regular people now have eyes and ears all around the world.

Furthermore, the tsunami blogs were much better at spreading information on giving charitable donations and finding missing family members.

Formerly viewed as a marginal activity restricted to webnerds and windblogs

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(we coined that term – a windbag with a blog), blogging is slowly becoming much more of a mainstream phenomenon on the Internet. Time magazine even named its first Blog of the Year, crediting the Power Line blog created by three attorneys for challenging mainstream media and questioning the validity of documents behind a 60 Minutes report on President Bush's National Guard service. And though blog readership has jumped significantly, the percentage of online Americans who actually write blogs grew only slightly – up from 6 to 7 percent over the last year. And still, despite all the media attention to blogging and the use of blogs as plot elements on popular television shows like West Wing, a large number of Americans remain clueless about the phenomenon — only 38 percent of Internet users even know what a blog is. Perhaps this is why the word "blog" was the most common word visitors to Merriam Webster's online site sought a definition for throughout 2004.

So how many blogs are there, out there? Technorati, which tracks the blog phenomenon, says that there are 5,367,349 weblogs right now. A few more statistics to consider. Perseus Development randomly surveyed 3,634 blogs on eight leading blog-hosting services to develop a model of blog populations. Based on this research, Perseus estimates that 66.0% of surveyed blogs had not been updated in two months, representing three and a half million blogs that have been abandoned. Apparently the blog-hosting services have made it so easy to create a blog that many tire-kickers feel no commitment to continuing the blog they initiate. The average duration of abandoned blogs is 126 days (almost four months). Males were more likely than females to abandon blogs, with 46.4% of abandoned blogs created by males, as compared to 40.7% of active blogs being created by males. Those who abandoned blogs tended to write posts that were about half the length as the posts of those who still maintained blogs, which simply indicates that those who enjoy writing stick with blogs longer.

Blogs are famed for their linkages, and while 80.8% of active blogs linked to at least one external site from a post on their home page, these links were rarely to traditional news sources. Only 9.9% of active blogs had a current post that linked to one of 2,875 traditional news sites. So blogging in practice is not just about linking to news articles. Blogs are updated much less often than generally thought. Active blogs were updated on average every 14 days. Less than 1% of blogs are updated daily. Blogs are favored by the young, with 92.4% of blogs created by people under the age of 30, following the trends of MP3s and instant messages. And females are slightly more likely than males to create blogs, accounting for 56.0% of hosted blogs.

BlogSpot and LiveJournal are the two market leaders, each with 31% of these hosted blogs. While BlogSpot is growing more quickly, its retention rate is lower, and the two sites should continue to race neck-and-neck in the near term in terms of active users. (LiveJournal was recently acquired by SixApart.) Based on the rapid growth rate demonstrated by the leading services, it's expected that we will see over ten million blogs by the end of next year.

The greatest indicator that blogs are entering the mainstream is the recent announcement that Microsoft will enter the blogging market, with the release of MSN Spaces. MSN Spaces allows users to create an online journal, and post photos and digital music lists. Users can establish different levels of visitor access, customize the blog with a choice of different backgrounds and layout templates and update the blog remotely via e-mail or mobile phone. MSN Spaces also features integration with the MSN Messenger instant messaging service and with the MSN Hotmail Web mail service. Thus, what was originally a geeky hobby is rapidly becoming a mainstream communications tool.

So why is Microsoft jumping in? Well, maybe because blogs have recently been proposed as the just-what-the-doctor-ordered in the business world to collect, organize, share, link and retrieve information among a group of peers. The idea is to have use easy, WSIWYG editing that is organized by time, an admittedly more lightweight method of ordering and distributing information than other publishing tools and editing systems. Add to this the idea of automated taxonomy services that help blogs link together intelligently, and you get a grassroots effort to build knowledge management from the ground up.

Also, a related technology to keep an eye on is RSS, short for either RDF Site Summary or Really Simple Syndication, which lets you have news notifications delivered to your desktop automatically, without you having to constantly check the site. It's sort of the kissing cousin of blogs, giving you easy access to blog content.

So where's the opportunity for new investors? Blogs are a tough place to make a lot of money. The key may lie in understanding that although most people think of blogging as a form of publishing, they're not. In fact, the vast majority of blogs are not read by millions of readers – begging for a syndication revenue model. They are read by nano-audiences, since most blogs enjoy no more than two dozen readers: they are only of interest to the family, close friends, fellow students and co-workers… these are very tiny audiences. Therefore, blogs are probably actually a form of persistent messaging.

Perhaps the integration of presence, IM, and blogs would be appealing to the typical teenage girl who uses it twice a month to update her friends and classmates on happenings in her life. If you think about it, IM has made money for wireless carriers. Thus, maybe a blog should not be viewed by the media through the mirror of its own nature… perhaps blogs should be seen primarily as a social phenomenon, and perhaps the key to a successful revenue model lies therein.

9. Slouching toward Nanotech

The author Joan Didion wrote the classic *Slouching Towards Bethlehem*, which provided a definitive portrait of the Sixties, an unblinking perspective of a country shredding itself apart with change, and a generation's loss of innocence. The novel's title was taken from a poem by W.B. Yeats, who wrote of *a*

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rough beast waiting to be born, where nothing is sacred, ceremony sinks and innocence is drowned.

Nanotechnology has recently experienced a similar drowning of innocence. The term "nano-technology" was first coined by Eric Drexler in 1977, who was, at that time, an undergrad at M.I.T. His book, Engines of Creation, published in 1986, introduced the term nanotechnology to the world at large. Drexler's vision of molecular scale manufacturing inspired a generation of chemists, computer scientists, and engineers to focus on science at the nanoscale. Peace, love, nano.

However, a more traditional school of thought is led by Richard Smalley, the Rice University chemist who shared the 1996 Nobel Prize for discovering fullerenes. This school declares that molecular assembly is basically a pipedream, and espouses a much more hardheaded and grounded approach to manufacturing nano-materials. The clash between the two schools became more heated, when the technical journal Chemical and Engineering News published a series of letters between the two leaders of their movements, when Smalley wrote, "Chemistry of the complexity, richness, and precision needed to come anywhere close to making a molecular assembler - let alone a self-replicating assembler - cannot be done simply by mushing two molecular objects together. While our future in the real world will be challenging and there are real risks, there will be no such monster as the self-replicating mechanical nanobot of your dreams."

After this very public thrashing, the coup de grace came only two days later, when George W. Bush signed the 21st Century Nanotechnology Research and Development Act, allocating $3.7 billion for molecular-scale R&D. In the months leading up to the signing, the bill had promised to bring Drexler's agenda to the forefront of the nation's scientific priorities. But in the end, no money was earmarked for molecular manufacturing. Instead, the funds were allocated to projects using variations on conventional chemistry to develop nano-materials. Hey, when the word 'billions' gets used, Big Science gets serious.

In the final analysis, Drexler's lofty goal of building molecular assemblers was fundamentally contradictory to conventional test tube chemistry, which won bigtime. In the final act of this play, Drexler has completed an almost theatrical fall from grace, ending with his rejection by the scientific establishment, a painful and public divorce, and a financial state that could only generously be described as solvent. Here lies a man who has given everything for his vision.

However, the drowning of innocence has led to the emergence of commerce on the nanotech stage. You must remember that enormous fortunes were at stake. The economic promise of nanotechnology is so enormous that it boggles the mind. Recent market research indicates that products incorporating nanotechnology will account for $2.6 trillion worth of productsby 2014, comprising 15% of global manufacturing output, and leading scientists in universities and industry tend to confirm the hypothesis that some areas of nanotech are ripe for commercialization efforts.

We believe that several subsectors of nanotechnology will heat up over the next few years, moving nano from gedanken experiment to actual revenues:

Consider *nano-bio-technology,* where nano-scientists might produce tools to help accelerate the drug discovery and development process, new drug delivery vehicles, or target identification and understanding of disease mechanisms. The use of nanostructured materials as new vehicles for more narrowly-targeted delivery of drug molecules is promising, with some early attempts already in the trial process.

Then consider *nano-electronics,* where nano-techniques can be utilized as sustaining innovations for existing electronics businesses. Look toward nanostructured memory devices, storage media, sensors, solar panels, and batteries. Patents on many of these new approaches are being filed now, and activity levels are high in these areas as well, so time is of the essence for prospective new entrants.

Charles Ostman, Senior Fellow at the Institute for Global Futures, and chair of the Nano Electronics & Photonics Forum suggests that even though companies like Intel will cling to visions of CMOS topdown lithographic manufacturing for many years to come, the "event horizon" actually approaching much more rapidly than they imagine. He believes that this is not so much because electron tunneling will force the market transition via the laws of physics, but because of the massive investment cost required to push the envelope of ultra-violet (ULSI) fab systems. He believes that a promising blended approach may be to develop an integrated "mix and match" strategy of utilizing current CMOS fab as the backplane or microscale circuit board for molecular scale integrated devices which could literally be "grown" on the surfaces of these platforms.

How about *nano-solar?* According to experts, nanotech solar cells could come down to fossil-fuel prices within a few years, which would drive significant adoption. Consider Nanosolar, based in Palo Alto, Calif., which is building nanotech panels that are 100 times thinner than current solar panels. This approach could let the firm mass-produce cheaper solar cells by printing them out like rolls of newspaper. Konarka of Lowell, Mass., is developing plastic sheets that are embedded with titanium oxide nanocrystals. This process produces a light-activated plastic that's inexpensive, lightweight and flexible. The plastic can be formed into any number of colors and patterns. Such material can then be embedded as a low-cost source of power into the outer shells of cell phones, gaming consoles, computers or rooftops.

Also, there's *spintronics,* also known as MRAM—the fast, dense, non-volatile memory technology that remains poised to revolutionize computer memory and portable consumer electronics. Projected by some to become a $50 billion industry by 2010, nearly every major tech company now has a hand in MRAM, and much of it seems to center around one small but crucial player, NVE Corporation, whose intellectual property portfolio may provide the basis for MRAM's development. Spintronics is a nanotech-

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nology that utilizes a quantum property of electrons called spin rather than its electric charge.

However, before you rush out and scream that nano has finally arrived, we need to stress that nanotech is only beginning to turn the corner to actual revenues and perhaps even profitability. And only in a few sectors that represent low hanging fruit, meaning that the time is ripe to cautiously consider investment in the nanotechnology space. Many perils and pitfalls are still there to trip up even the most cautious investor – too many me-too bandwagon copycats proposing to enter commodity material production, brash startups proposing to compete head-on with multinational corporations in development of sustaining innovations, and finally, far too many visionaries who do not understand the challenges in scaling to commercial production volumes or fail to develop a meaningful and rational intellectual property strategy.

Yes, nano is finally a top ten trend here, but let's be careful out there!

10. Small Planet Blues

As the Information Revolution brings the world closer together, it also makes it easier for a lower cost knowledge or service worker in India or China to reach a business in America or western Europe, and thereby replace a higher cost worker. According to Gartner Research, one out of every four high-technology jobs in developed countries today may be outsourced to emerging markets like India or China by 2010. Forrester Research predicted that over 830,000 U.S. service jobs would be lost to offshore outsourcing by the end of 2005, and 3.4 million by 2015. Celent says that offshoring has put a potential 2.3 million jobs in the U.S. banking and securities industries at risk, and will shift US$17.5 billion in operational and technical costs overseas by 2010. Man, that's a lot of jobs.

Outsourcing has been a growing phenomenon in the United States and is catching on now in Europe as well, with 2004 a major turning point. Suddenly, the typical America understands why farmers in Third World countries protest the WTO so vehemently. The reality is that there's no shadowy conspiracy out to destroy the lives of indigenous farmers in Java or the careers of high paid Java programmers in America. The world is simply getting smaller, the Information Revolution is forcing the entire world to become a melting pot, and there's no turning back the hands of time.

At the same time, the U.S. has begun to fall – significantly – behind foreign competitors. For over half a century, America has been the world's undisputed heavyweight champ in technology. U.S. research institutions have been the best on the planet; the U.S. capital-formation machine turned their discoveries into one breakthrough after another in transistors, communications gear, computers, and just about every other key high-tech field; and U.S. grown ventures like IBM, Intel, Hewlett-Packard and Microsoft dominated world markets. *Not any more.*

In Western Europe, the Nordic countries now lead the world in designing and making cell phones. In Asia, Japan is beating America in a number of crucial fields, including optical electronics, robotics, and semiconductor-making equipment. China is planning to be the world leader in the fabrication of semiconductors by 2008, with the largest chip market in the world at about $50 billion. Over in India, engineers are finding that they can easily compete with Americans for high-value-added jobs. Furthermore, Finnish, Chinese, and Indian entrepreneurs are not content just to build our designs: they aspire to design the next wave of innovations and dominate those markets. Good jobs are being outsourced to them not simply because they'll work for less, but because – quite honestly – they are often hungrier, more determined, and better educated in the math and science skills required for 21st-century work.

Even more impressive is that Southeast Asian nations and China signed an accord to create the world's biggest free trade area by removing tariffs for two billion people by the end of the decade. Leaders in the 10-member Association of Southeast Asian Nations (ASEAN, which consists of Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam) also signed a pact to create an ASEAN Community along the lines of a unified Europe by 2020. It aims to create a common market with common security goals. ASEAN members are actively talking of creating their own "reserve currency" to compete with the dollar and the euro. On an even larger note, Japan, South Korea, Australia and New Zealand have all agreed to start free-trade talks with the ASEAN countries.

So what's happening in America as the Bengal tiger crouches and the Asian dragons come out of hiding? If we take a long hard look at America, we can see that the United States is facing a difficult transition, with three simultaneous challenges that are based on the aging of America, globalization and terrorism. And the technology trends generally don't look good for America. Let's look at a few areas of technology and how America fares against the rest of the world.

Consider broadband penetration. Some observers contend that the United States is lagging behind other industrialized nations in a race for technological leadership and prosperity in the future because of its failing performance in the prevalence of high-speed Internet access – specifically, the United States has fallen from sixth, to seventeenth. South Korea is the world leader in broadband penetration on almost 25 broadband lines per 100 people, with Hong Kong in second place with 21 lines per 100 people. So where is the United States in this line-up? 6.1 lines per 100 people use a pathetic mid-band infrastructure that's marketed in the US – somewhat cynically – as broadband.

Consider next generation cellular technology. One hundred and thirteen third-generation (3G) cellular networks have been deployed worldwide, rapidly spreading across Asia and Western Europe. Japan and South Korea are the undisputed 3G leaders, and account for over 70 percent of the world's 27.2 million WCDMA and EV-DO 3G subscribers. Where is the United State? Way

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behind, with only 70,000 of Verizon's 42 million subscribers signing up for its high-speed data service. And no matter how fast U.S. telecoms scramble to catch up, they are now years behind. A report compiled by the ARC Group predicts that 3G handset sales will continue to grow over the next several years in Japan and Korea and reach a 90% penetration for 3G cell phone subscribers by 2009, compared to a measly 14.4 percent in the U.S. by that time.

There are a plethora of indicators – IPv6 penetration, investment in nanotech, support for stem cell research, educational performance, you name it – and all of it adds up to an America that is definitely falling behind. The direct consequence is America's growing inability to dominate markets for tech equipment. In 1992, the U.S. exported about $35 billion more in high-tech equipment and goods than it imported. By 2002, according to the American Electronics Assn, the U.S. racked up a record trade deficit of $54 billion in tech goods. That coincided with a 10% drop in U.S. tech employment from 2000 to 2002, and America's freefall in terms of educational success.

So why *is* America falling behind? Part of the reason the U.S. is falling behind the competition stems from the industrial development policies of foreign governments. Unlike the U.S., countries as China and Singapore are happy to co-fund tech startups and offer them 5- or 10-year tax holidays. In fact, the government of Singapore will pay 35% of the cost of new ventures in order to bring high value innovation into their countries. And these aggressive catch-up policies are beginning to work.

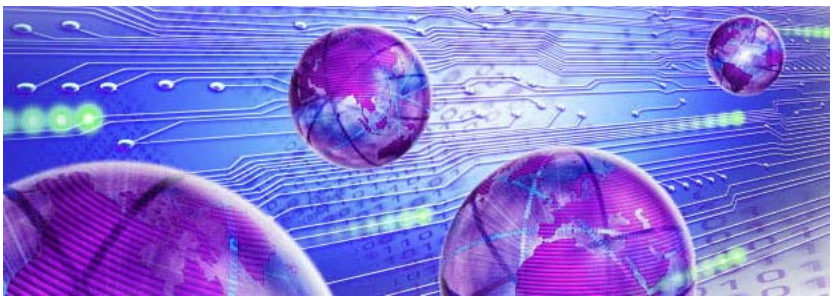
In stark contrast to China and Singapore's pro-high tech business policies, the Bush Administration has insured that the Defense Dept. has been the primary beneficiary of spending for science and technology research and development. Yes, it has been spending most of its funds on weapons development, not basic research and key competitive technologies, according to the American Association for the Advancement of Science (AAAS).

Another reason is the slow decay in science education in the United States. According to the National Science Foundation, American universities awarded 220,000 bachelors degrees in science and technology in 1999, vs. 322,000 in China and 251,000 in India. As recently as two decades ago, China and India were handing out only a small fraction of that number of degrees. What's more, China and India's lead will widen as the share of Asian students who go to college rises over next two decades from the current 4.6% to closer to the U.S. figure of 32%. Also, nations such as Korea, Norway, the Czech Republic and Japan have had faster growth in high school completion, and have passed the United States on the way up the rankings, while the U.S. has dropped from first place to tenth, worldwide.

While other nations are ramping up their spending on education, the U.S. simply isn't. Since the 1990s, increases in state and federal funding for public universities has significantly lagged behind inflation, and tuition at these institutions has soared. According to a 2002 study by Washington D.C. think tank Brookings Institute, state appropriations for higher education fell from 7.3% of total spending in 1977 to 5.3% in 2000. The result? State universities, key players in the research universe, are struggling to make ends meet.

Never before have so many countries in the world sought to emulate the U.S. system of innovation. Emerging countries like China are voracious consumers of innovation systems and to diffuse these innovations, these countries will build hundreds, if not thousands, of technical schools and colleges over the next ten years. This is because those countries realize fully that transformation can successfully be realized only by building, strengthening and fine-tuning complete innovation systems that are able to compete with the efficient innovation systems of Japan, USA and EU. Then, as legions of bright and motivated researchers find themselves happy living outside of the U.S. and more and startups appear in emerging economies, a new worldwide technology race will taking shape. And it promises to be a marathon.

So, will the United States sing the Small Planet Blues, or will it find the vision necessary to recreate the Clinton era successes in generating prosperity, jobs, technology leadership, international cooperation and respect? Will it learn from it's competitors to begin implementing proven policies for stimulating high technology growth, in the form of startup jobs credits, increased funding of basic research and reduced dependency on death sciences, tax holidays for investors willing to fund critical technologies like nanotechnology for energy independence and stem cell sciences, and accelerated deployment of IPv6 and spectrum for broadband wireless? Will the United States regain the spirit to fight its way back up the ladder, in terms of broadband penetration, science education, 3G deployment, quantum computing? Well, that's beyond our ability to foretell. All we can see is the trend, which is heading south for the United States, and north for emerging countries like China and India.



SEVEN SOCIAL TRENDS TO WATCH FOR IN 2005

Trends will affect and reflect consumer behavior – so watching social trends can help manufacturers to develop more desirable products, and at the same time, understand how best to market them. With this in mind, we've gathered data from all over the place, and have formulated these consumer trends for the high tech sector, to remind you that "It's the customer, stupid!"

Me Me Me!

Being unique is a tough job, but somebody's gotta do it. So many forces in our lives dictate and demand uniformity. So even though it takes a more work, shoppers scrounge to find products that help them reinforce their sense of uniqueness and online denizens strive diligently to bolster their sense of identity. Ever wonder why are there over 5 million blogs out there? Or why are members of online social networks are so hungry to sign up everyone they can as an online friends to boost their popularity scores? I mean, just how high school can we get?

Incidentally, this sense of identity and empowerment doesn't come from monogrammed white shirts. It often comes from emblazoning someone else's name on your favorite product, usually a totem or celebrity on clothing or an MP3 player. Witness the U2 special edition iPod. Part of it is the cachet of being an early adopter, but the rest is much more complex. It's all about the search for meaning and power and coolness.

Everybody's a Player!

People behave differently when they're behind a mask, and technology often provides just the mask they're yearning for. Obviously, in a chat room, you can be an Asian hot babe even if you aren't Asian, hot, or even a babe. But the mask of technology is extending beyond the anonymity of hot chat, into real life.

Consider, if you will, the phenomenon known as the cell phone stare. There's a guy talking on a cell phone and while talking, starts checking out the woman walking by. Normally, this guy would only sneak a peek. But once he's on the mobile and using a headset, he's a player. With the shield of technology, he can be absolutely brazen. Part of this effect comes from the fact that his mind is engaged in a private conversation space, and feels insulated. When you're talking on the phone, part of you is no longer here, now split. And from this point, voyeurism is tacitly allowed.

The power of technology as mask can be seen even more powerfully on Craigslist. If you've ever scanned Craigslist's personal ads, known as Casual Encounters, they're really quite wild. One recent ad read, "Hey, are you Asian and interested in a little NSA fun? If you are, I've been wanting to cross Asians off my list. Send me a pix…" (NSA doesn't stand for the National Security Agency, it stands for No Strings Attached.) Another read, "I just caught my boyfriend cheating and I'd like to get even. Please send pix and details and why I should choose you for this one-time-only revenge sex fantasy of your lifetime…"

In the ancient past, when we had newspapers, people would have to go in and place personals, which would run later that week, and would have responses sent to an anonymous mailbox somewhere. It took a lot of planning and work to be sleazy. But with Craigslist, the exploration of a secret life has become an impulse sale item. Suddenly, everybody's a player.

Finally, cell phones and virtual identities are helping to develop a new creative class. Add a few classes at digital film school, buy a camcorder, and start on a screenplay… and the next thing you know, you're a filmmaker. You're suddenly one of the new elite, whose creativity will touched our lives of the rest of us. But it's more than just a celebration of creativity and individualism, or the dawning of a new age of expression in the arts, it's about being a player! Imagine yourself in a coffeehouse, and the mobile rings. Someone cute is nearby, so would you rather be overheard talking about getting the second quarter numbers or second rewrite done on time?

The Eternal Teenager

Because boomers refuse to grow older, if you market to people at their true ages, they'll resist the message. (At the same time, kids want to be treated like adults.) The instant upside to all of this is that you get to simplify your message and target for the age 35 median. But more importantly, this search for the fountain of youth has many ramifications. Botox is only the beginning. Think Extreme Makeover or The Contender for people in their 40s and 50s attempting to regain the splendor of youth. Think cosmetic surgery, dermatologists, acupuncture for eyelifts. With the baby boom entering retirement age now, this is the mother of all markets.

Lifestyles of the Poor and Pampered

Let's face it, we're broke. America is enduring tough times, outsourced jobs, terrorism… so dammit, why can't we have that pedicure, spa massage or the Manolo Blahniks? Don't I deserve a little happiness (sniffle) to make up for all the pain and suffering that I have to put up with? Well, the American dream of luxury and comfort hasn't died, it just needed to be affordable.

It's not a contradiction. The democratization of luxury has slowly been developing over the past decade which is pressuring top-tier marketers to innovate faster in order to reach the aspirational consumer. Mass consumable luxury goods are possibly the hottest trend in the world, experiencing tremendous growth of 10 to 20 percent annually. Last year, luxury purchases accounted for about 20 percent of the $2.35 trillion American retail sales market. The trends for the world mimic what is expected from America where 47 million households desire luxury, projections for the market are expected to expand from $400 billion to $1 trillion by 2010. Globally the trend is also on the steep incline with continued support from Japan and Korean and the emerging and considerable emerging luxury markets of Indian and China. In other words, thousands of millionaires are flourishing

SEVEN SOCIAL TRENDS TO WATCH FOR IN 2005

in once former communist countries, and their need to distinguish themselves and define their class is even stronger than in America.

The question is then how can a commodity product be positioned as a luxury? Well, consider the consumer cleaning product marketplace. I mean, if you don't have a maid and have to clean your own sinks and toilets, doesn't that mean you shouldn't be buying luxury products? Well, smart marketers are positioning consumer cleaning products as affordable luxuries. Take a look at the popularity of Procter & Gamble 's electrostatic wipes, and the abundance of specialty wipes (pet wipes, microwave wipes, face wipes, hand wipes, disinfecting wipes, leather wipes and microfiber wipes) or the newest aromatherapy cleaning products on the shelves of stores like Williams-Sonoma and Bed Bath and Beyond… or the more than 500 books published in the last year on the subject of cleaning are further evidence that cleaning house is the millenium's latest trend.

Fadvertising

There's a great line from Oliver Stone's movie, Wall Street: "Man looks in the abyss, there's nothing staring back at him. At that time a man finds his character." Well, the world of advertising is about to stare into the abyss of broadband television. If you've ever tried out BitTorrent or used a Tivo, you know that the traditional 30 second ad spot is quickly heading toward an event horizon. The future of television will not what we remember from the 20th century. Think of TV over the web and on cell phones and on a myriad of unimagined portable devices.

As a result, advertisers need to re-engineer the art of advertising to survive the coming Mice Age of interactivity and broadband distribution. Three required changes: embedded ads, personalization and fadvertising. Embedded advertising means that the ad is placed into the content, whether it's a TV show or a syndicated blog entry, so that it survives editing and repurposing. Personalization means being able to dynamically recompose both content and ads to fit the exact demographics and segmentation of your customer. And fadvertising means to think strategically so that your entire campaign can act synergistically to trigger a self-fulfilling and self-reinforcing avalanche of acceptance and coolness. Consider how Apple uses a critical mass of product placements to make iPods look not only cool, but indispensable.

Multitasking Madness

Life really is getting crazy. People are often working longer hours, if not two jobs to keep up, they're driving while talking on their cells, they're checking their e-mail just about every chance they get. If you overhear conversations, you'll notice that most people finish each other's sentences these days. News reports are distilled into soundbites, and even magazine articles are formatted to read in about the amount of time it takes to take a... ah… excuse me, but I digress.

Multitasking is now rampant and personal time is compressing. Suddenly, you start to believe that it's better to buy airline tickets last minute, that speed dating might actually work, that instant messaging is better than sending a handwritten thank you note, that you just can't live without a RIM pager and a PDA. What's more, we're facing the phenomenon knows as 24 hour everything. About twenty years ago, before the ATM big bang, people actually had to get money for the weekend on Fridays. It was called "WAM", for weekend activity money. But with ATMs, Internet shopping, 7-Eleven's everywhere, it's now assumed that not only do you need to multitask, but you need to do it 24/7.

As a result, there has been a subtle backlash to this phenomena. Trendsetters have begun choosing the option of chilling, checking out, logging out, going off the net. As a result, yoga, Tai Chi and meditation are on the upswing. Anything to get a little quiet time. As our lives become more compressed and demanding, as we are forced to juggle career and family and other obligations, there is slowly growing the realization that we need to reclaim balance to our lives. However, the pressure to multitask is real, and smart entrepreneurs will create solution that work within the constraints of time compression, for example, the 30-minute spa vacation, the mini-chill, the oxygen bar.

Life Caching

Like replicants in Ridley Scott's dystopic classic Bladerunner, we all cherish Grandma's fading photos of her wedding, Dad's grainy Super8 movie footage of our picnics, and anything else that reminds us of our lost childhoods. Through these photos we can remember our selves and strengthen the meaning of our lives. In a house fire, most people try to save the family photo albums! That's how valuable our memories are to us.

But what will future generations treasure? Grandpa's early blog entries? Automatically collected digital photos from your bar mitzvah, assembled from all your friends who published them online? As we learn to click to save every moment of our lives, data will become the stuff that memories are made of. Life caching is a term coined by Reinier Evers of trendwatching.com, who notes, "Consumers will come to expect that they can relive every experience they've ever had and have instant access to any life collection they've ever built."

Memory making has been big business for a while. Kodak was basically built on the need to concretize memory. More recently, Nokia's Lifeblog service lets users download and arrange their cell-phone-created content-messages, photos, videos, notes and audio clips into a format that instantly displays your life as a river of events and memory.

(This article was co-authored by Nina Markman, Trend Analyst.)

Five Hot New Products to Watch Out for in 2005

They may not all succeed, but they're definitely worth watching for:

The Incredible Shrinking Plasma TV

Everybody wants one, but who can afford it? The thin-paneled Plasma TV, which has come to symbolize style and status, can cost thousands of dollars. However, sometime this year, prices will drop as much as 30 percent, triggering a spurt in sales and HDTV viewership. Also, DLP makes inroads into this market. In fact, Demand for Dell.'s plasma televisions is outstripping supplies, pushing deliveries to six weeks. Dell sold four times its initial forecasts. Dell began taking orders for the two 42-inch diagonal models, a $3,500 high-definition set and a $2,300 enhanced-definition set, last Oct. 27.

The Internet TV Receiver & Media Center

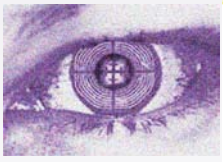
Everybody is getting into the act. Disney this year expanded its launch of Moviebeam, a Video On Demand service that enables users to download movies via a broadband set-top. And Akimbo, a start-up company, introduced a video player that can pull niche programming directly from the Internet to your TV screen. In 2005, more companies will experiment with Internet TV receivers, including cable and satellite TV operators. We're waiting for a BitTorrent Box, a dedicated P2P application, running on Linux with a 250 gig hard drive, serving content to the digital home.

Personal iTV

Apple put video into the iPod, but when are they going to get serious? When can we expect to see an avalanche of competitors to Sony's LocationFree system or the DVX-POD? Consider for example, the world's lightest Tablet PC, which is the NEC VY11. It's 1.95 pounds and only 11mm thick, and is a dream to watch movies on. Something like this, connected by 802.11n to the home media server, would be just fine by us! Should we expect an iPad from Apple anytime soon?

The Home Robotics Big Bang

At the end of 2003, there were about 610,000 autonomous vacuum cleaners and lawn-mowing robots were in operation. Over the next three year, more than 4 million new units are forecasted to be added. Expect to see a plethora of new and cute domestic robots at your service to mow lawns, vacuum floors, clean your windows, clean your pool, and manage other household chores. This is the decade of the intelligent, autonomous labor-saving device.



The Dream Laptop

The Panasonic R3 ultra-portable commands an 8.5 hour battery life. Sony has pushed notebook technology to a new limit with its carbon fiber X505 notebook. We're slowly getting there: the ultimate laptop. Our prediction is that it'll be ready in time for Christmas – a 3.0 gigahertz Pentium M, a gig of RAM, a 200 GB harddrive, 1400x1050 pixel screen, an SD slot but you won't need it because it'll come with 802.11n, BlueTooth and maybe even GPRS, and it'll run XP Pro, Service Pack 3, because Longhorn will not ship anytime soon.

Tasty News Tidbits for Dessert

To the Moon, Alice

According to the US Planetary Geosciences Institute, a potential gas source found on the moon's surface could hold the key to meeting future energy demands as the earth's fossil fuels dry up in the coming decades. Mineral samples from the moon contained abundant quantities of Helium 3, a variant of the gas used in lasers and refrigerators as well as to blow up balloons.

"When compared to the earth, the moon has a tremendous amount of Helium 3," said Lawrence Taylor, a director of the Institute's Department of Earth and Planetary Sciences. "When Helium 3 combines with deuterium, the fusion proceeds at a very high temperature and it can produce awesome amounts of energy. Just 25 tons of helium, which can be transported on a space shuttle, is enough to provide electricity for the US for one year. This is not science fiction."

Helium 3 is deposited on the lunar surface by solar winds and would have to be extracted from moon soil and rocks. Some 200 million tonnes of lunar soil would produce one tonne of helium, only 10 kilos of helium are available on earth. However, the problem is that there is not yet an efficient type of reactor to process helium 3. Scientists figure it'll take 30 years to solve all the problems.

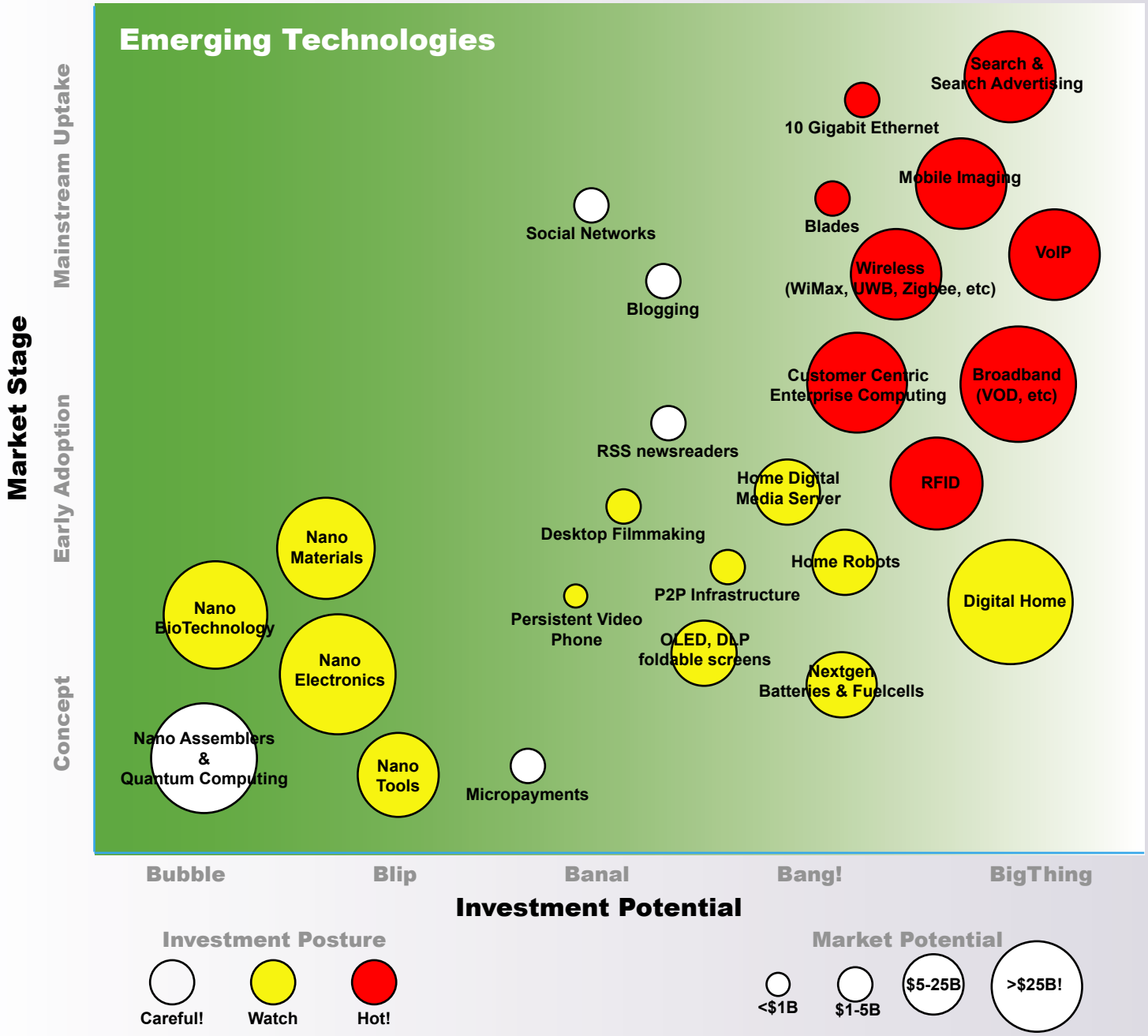
Taylor warned the group of the likelihood that humans could soon exhaust the supply of fossil fuels like oil, coal and gas. "By 2050 the whole world will have a major problem. We need to be thinking ahead. Right now we are not thinking ahead enough. Some of us are. But then the people who make the decisions and put money on the projects are not. They think only about the next election."

IBM in a sharing mood

The largest horde of U.S. patents is held by IBM, which says that it now plans to donate 500 patents for free use by software developers, marking a major shift of intellectual property strategy for the world's top computer maker and a challenge to the high-tech industry. The intriguing strategic move was meant to encourage other companies to unlock patent portfolios in order to spur technological innovation. The 500 patents cover areas such as storage management, simultaneous multiprocessing, image processing, database management, networking and e-commerce. The IBM Patent Commons is probably also intended to enable Linux to withstand the threat of Microsoft lawsuits. This is huge; an action that could literally change the world.

Strategic Mapping

Here's an eagle's eye view of the venture investment space. Use this map, or develop your own, to help spot the emerging trends and new opportunities. Strategic mapping is a powerful tool for better visualizing both overall and specific markets, and to analyse data to take advantage of hot spots that competitors may not even be aware of yet. If you'd like some help in developing a customized map that models your fund's thought process, consider using strategic consulting services from Next Generation Ventures. Find out more at www.NextGenerationVentures.com.



NBT Trend Database

Tech	Definition	Enablers/Inhibitors	What to Watch for	Horizon
Mobile Imaging	Market ecology forming around mobilized picture taking	Enabler: 800 million users by 2008! Inhibitor: Privacy concerns	Global uptake finally spreads to the United States, known as a wireless laggard.	2006-2008
VOIP	Radically changes the telco landscape through voice/data cost arbitrage and capabilities	Enabler: Telco buy-in nhibitor: Regulatory constraints, slow business VOIP uptake	Cable industry rollout of VOIP services, virtual area codes provided for VOIP users, 911 integration. However, expect that the FCC will stall and stall.	2005-2008
Customer Centric Computing	New set of capabilities for enabling the realtime enterprise, including web services, agents, mobility, BPM3	Enabler: Real ROI nhibitor: Developer Uptake	Developer uptake, meaningful standards development, solve the Web publish/subscribe problem. This sector is a major sleeper.	2005-2008
10 Gigabit Ethernet	Next generation Ethernet	Enabler: 10 GigE applications Inhibitor: Pricing and overhang	Adoption by telco and businesses, price commoditization	2005-2008
Digital Home	New standards and focus on bring-ing the Internet to the living room, kitchen, bathroom, etc	Enabler: Intel Inhibitor: Standards War	Slow and methodical uptake, starting with the entertainment center. Look at medical and telematics verticals, esp. monitoring the elderly and home health care.	2006-2010
Wireless	The Wireless alphabet soup (UWB, Zigbee, WiMax, etc) is clarified	Enabler: Intel Inhibitor: Regulatory morass	Growth of Hotspots, full coverage of metropolitan areas, emergence of mesh networks based on WiMax, growth of Zigby.	2006-2008
RFID	Wireless ID tags allowing enhanced inventory tracking, etc	Enabler: Walmart, DOD Inhibitor: Privacy concerns & price	Price for tags drops to under 5 cents, and USPS decides to use RFID.	2008-2010
Home Media Server	TIVO on steroids, with P2P	Enabler: content, content, content Inhibitor: piracy, digital rights management	Think Windows Media Center plus 500 gigs and a really easy user interface, and you get a device that allows a television signals, downloaded movies or music, to be played in any room, any device, by way of a home wireless network.	2006-2008
Next Gen Displays	Organic light emitting diode, the future of mobile display technology	Enabler: Kodak, display quality Inhibitor: Short product lifetimes	Production problems solved, FOLED (flexible OLED) roll-up displays announced.	2006-2008
IP PBX	VOIP based PBX that reduces costs and enables new converged apps	Enabler: Already real, proven ROI Inhibitor: Recession	Adoption by SMBs. One issue is that capital expenditures have still not recovered.	2005-2008
Next Gen Batteries	New battery technologies	Enabler: New chemistries Inhibitor: 10% improvement in density per year	Between Lithium air cells, nanotube-based batteries and fast-breaking innovation in fuel cells, expect a 5-8x disruptive increase in battery density during next five to eight years	2008-2012
Blades	Server blades are more cost-efficient, smaller and consume less power than traditional box-based servers	Enabler: Already real, proven ROI Inhibitor: Recession	Slow and methodical uptake. One issue is that capital expenditures have still not recovered, and current equipment is still not obsolete.	2005-2008
RSS	The use of RSS technology has been touted as a spam-free alternative to e-newsletters.	Enabler: ATOM and RSS standards. Inhibitor: Needs a revenue model!	It's happening, no way to stop it.	2006-2008
Home Robots	The Roomba vacuum cleaner has opened the way for home robots.	Enabler: China=based manufacturing. Inhibitor: Not ready for primetime!	Time saving robots that perform certain household chores will become as prevalent as dishwashers today.	2006-2008
Desktop Filmmaking	Emerging technologies for digital production and distribution of films	Enabler: DVX100, Final Cut Pro Inhibitor: Prolif. of bad movies	First low cost HD camera with Film Look released. An Academy Award won by movie shot on this camera.	2007-2010
Social Networks	Online communities, renewed with a vigor and lots of VC.	Enabler: Million of users Inhibitor: Lack of revenue models	Development of ROI and sustainable revenue model. Google offers Orkut + Blogger integrated. Yahoo releases Mingle.	2005-2008
P2P Infrastructure	Peer to peer infrastructures for distributed file sharing and storage	Enabler: Already real, proven ROI Inhibitor: Security	Somebody figures out a killer app outside of petty larceny and music/movie sharing. Major movie studios embrace P2P + DRM solution.	2005-2010
Nanotech	Nano scale materials, tools and technologies.	Enabler: Enormous promise Inhibitor: Takes a long time to make it real	Meaningful revenues generated on early wins in nano-bio, nano-solar, etc. Large players like IBM, Intel announce breakthroughs that sustain continuation of Moore's Law.	2015-2025
Persistent Video Phone	24/7 video conferencing connection	Enabler: Broadband Inhibitor: ISPs will hate it	A niche market, most likely, but this might be the special sauce in VoIP.	2006-2008

About Moses Ma, Editor

Moses Ma is a technology futurist, and as the Editor-in-Chief of the Next Big Thing, he will provide insights and foresight on the evolutionary and revolutionary changes in the technology landscape. He is also the Executive Producer of *The Cameraphone Summit,* the premier conference venue for the emerging mobile imaging industry. Previously, when he foresaw the enormous potential of the Internet, he was named a Distinguished Research Fellow at CommerceNet, where he predicted the B2B explosion, coined the term eMarkets, co-produced the highly successful *B2B Big Bang!* conference series, and started up a dotcom called Bizbots, which focused on next generation electronic commerce systems involving multiple, interacting software agents.

He has been noted as an Internet visionary in publications such as *Time Magazine, the New York Times,* and *Fortune Magazine.* His early background was in theoretical physics (at Caltech), and a long long time ago, in a galaxy far away, he founded the acclaimed games company, Velocity, where he helped to develop a number of bestsellers, including *Spectre,* the first commercially successful network game for the Internet.

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About the Next Big Thing
The Next Big Thing is a bi-monthly newsletter that provides insightful news, analysis and insights about the venture industry, for both investors and entrepreneurs seeking capital. How do we do help you figure out the Next Big Thing (NBT)? Because we gathered the cream of the crop of experts, from leading venture capitalists to corporate technology leaders to visionary entrepreneurs, to gain some insight into the question of what it will probably take to jumpstart the old stock-ticker, and get the public equity market to believe in the market again. Then, we delve into the nature of an NBT, so we can better discern between a true hotspot and the next emerging bubble. Is this NBT the real thing and a sure thing, based on hard science, or is it just another faddish new concept play based on hype? This is your best source for insights that could be critical to your business intelligence., accelerate your wisdom curve, and stay ahead of the competition.

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