

# Impact of Convergence on Technology Industry

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# CONVERGENCE: WHAT DOES IT MEAN

HOW THE PIECES ARE COMING INTO PLACE	WHAT THE COVERGENT WORLD WILL LOOK LIKE	BETTING BIG ON CONVERGECE: Five companies	BETTING BIG ON CONVERGENCE: Dangers	WHAT MUST HAPPEN FOR CONVERGENCE TO PAY OFF
<p><b>Bandwidth explodes:</b> High speed lines are now being used by one-third of U.S. households, with higher percentages in parts of Asia. Some 14 million broadband users run wireless networks at home. This is a vital plumbing for delivering music and video there.</p>	<p><b>Networks galore:</b> Entertainment and business move onto high-speed networks, within homes, offices, and throughout the mobile world. Most wires disappear.</p>	<p><b>1) SAMSUNG:</b> Shaping up as the titan of hardware, the Korean company is a power in TVs, phones, and components such as flat screens and chips.</p> <p><b>2) MICROSOFT:</b> Sees Windows linking a plethora of new music, phone, and video services. Banking on xBox and media PCs for the living room.</p>	<p><b>1)Lacks</b> entertainment programming to sell with its machines, which would distance it from hardware price wars and Chinese manufacturers.</p> <p><b>2)Couch potatoes</b> may resist linking entertainment systems to software known for complexity, crashes, and viruses.</p>	<p><b>Simplicity:</b> Manufactures must make networking a house and setting up mobile services as simple as plugging in a TV. If they fail, the promise of the technology will remain locked inside the box-and only geeks will buy it.</p>
<p><b>Flat-Screen TVs every where:</b> Massive investments in Asia should drive down prices of flat computerized TVs by 50% within two years. These will become the essential furniture of the networked home. Ever increasing demand for more bandwidth to fill high- high definition screens.</p>	<p><b>Programming explodes:</b> Myriad Websites compete with TV networks, and legions of individuals beam their own video up to the Web and become programming publishers.</p>	<p><b>3) IBM:</b> Is betting that untangling converging technologies will be big business for its service group. Big Blue is also creating new chips with Sony for video games.</p>	<p><b>3)Up-and-coming Chinese chip foundries</b> eventually may succeed in undercutting IBM on price to power next-generation game machines.</p>	<p><b>STANDARDS:</b> The industry must settle on a strong standard for digital-rights protection. Without it, studios and publishers will withhold music and programming. Other technical standards should allow all the pieces to work together, preferably from a single remote.</p>
<p><b>Don't buy, subscribe:</b> New offerings such as Rhapsody's music service, Comcast's Video on demand, and Disney's MovieBeam deliver music and movies via the Web. Content collections sit on the network, and subscribers click for music and programming.</p>	<p><b>Time fades away:</b> TV and radio schedules virtually disappear as programming-on-demand takes over everything except major sports and news events.</p>	<p><b>4) INTEL:</b> Is spending \$2billion to build chips for the full gamut of coming machines, from smart phones and flat-panel TVs to handheld video players.</p>	<p><b>4)The chip giant</b> is battling on enemy turf. Texas Instruments has more savvy in communications, while IBM and Sony are tops in games.</p>	<p>Standards as above.</p>
<p><b>Smart phones proliferate:</b> Cell phones should be in the hands of nearly 2 billion people by 2007, up from 1.3 billion today. The coming gizmos will connect to the Web for e-mail, music, and video clips from anywhere, anytime.</p>	<p><b>Voices with faces:</b> As phones merge with computers, video calls finally take off. Far-fling teams work on shared documents in virtual meetings, igniting offshoring and telecommuting.</p>	<p><b>5) COMCAST:</b> Plans to equip its 21 million subscriber homes for Web phone service within 18 months, and its Video on Demand could shake up the industry.</p>	<p><b>5)Its cable connections</b> are slow by global standards. And consumers could bypass cable, to download programming directly from studios and artists.</p>	<p><b>OPEN PLATFORMS:</b> Startups and individuals will drive growth with explosion of new services, applications, and programming-but only if they can develop on a free and open software platform not ruled by any one group or company.</p>

# There is rush to innovate

- The rise of convergence technologies is ushering in the most disruptive period in business cycle (See prologue).
- Two factors are driving this phenomena:
  - Relentless evolution of technology
  - Technology industry's hunger for growth

- For decades, the mere idea of a computer company making Brazilian TVs or French phones would have been laughable. Those markets were cloistered behind varying standards and a maze of diverse technologies.
- But with the spread of digital technology and the rise of Internet standards, those differences are melting away.

- The chips and software and network connections that have defined the computer industry are spreading quickly into other domains. For tech companies grappling with a maturing computer industry, these new markets brim with potential growth. “As technology converges, our opportunities expand,” says Intel Corp. Chief Executive Craig R. Barrett. “This is where we’re pumping all of our resources.”

(Ref.: “How convergence is transforming the tech industry, Special Report in Business Week, Asian Edition, June 21,2004, pp. 51)

- This is bringing in the rush to innovate.
- The ecosystem for the new networked machines is taking shape on three fronts. Year 2004 scene is that:
  - World over homes are gearing for broadband access to the Internet.
    - The accesses may be inefficient, but they are always on.
  - Homes have started linking their computers with wireless home networks.
    - These links may be weak, but they provide a base to grow.
  - Mobile phones and all the facilities they offer have arrived on the scene.
    - The first data services – radio, photos, and short video clips- are starting to take off.

- As these technologies evolve over the next decade (2004 forecast), a new world will emerge. Analysts predict:
  - Networks will speed up by an average of 50% a year, the historic norm.
  - In advanced world, faster broadband and mobile systems will be strong enough for commuters to check for traffic jams and watch soap operas on their cell phones.
    - In Japan and Korea, this is a reality in 2004 itself, while U.S. will catch up in a decade.
  - By 2009-10, practically every machine in the realm of communications- every gadget that sings, talks, beams images or messages- will sport powerful computer and a network connection. And every bit of digital information, whether it's phone call , a song, a Web page, or a movie, will flow among these machines in the very same river of data.
  - By the end of this 10-year-cycle (i.e., by 2010-15), the change could be extreme:
    - Web pages will snap life.
    - Hundreds of thousands of political bloggers, flu fishermen, and chefs will be uploading gobs of video programming- creating their own channels.
    - This plethora of Web shows will compete for attention with TV fare, Internet radio, video e-mails, and games.
    - All of it will play on televisions, computers, and cell phones, which will be different flavors of the same machine. The concept of a network or a channel will go away. They are artifacts of old technology.

- The dramatic shifts ahead are likely to shakeup age-old concepts at the foundation of economic life. In the coming markets of moving bits, who owns what? Will people buy programming and machines? Or will they rent and subscribe? Innovative companies will sort out these questions, leading the way in building new business models for the coming age. Those who figure out how to reach through the networks to deliver customized information and services will be the architects and kings of the converged economy. Michael Moe, co-founder of ThinkEquity Partners LLC, a San Francisco investment bank, predicts that those people and companies will rise quickly. “Five years from now, it will be over,” he says. “The winners will be determined.”
- Said differently, the clock is ticking- pushing companies to hurry into bruising and unformed markets far from their roots and their expertise.
- The process, as Nokia Corp. can attest, is often humbling.
  - A year ago, Nokia Corp., the Finnish company, created N-gag, a handheld phone-game console designed to beat the consumer electronics champs into a new hybrid market. But its awkward design drew scorn from gamers, and today even Nokia admits the first version was a disappointment.
  - Then there is Intel, AT&T, and IBM joint venture in 2002 called Cometa Networks Inc. The goal was to link all the Wi-Fi hot-spots into one seamless network. But in May 2004 Cometa said it would shut down, the victim of fierce competition and an embryonic business plan. Say Sky Dayton, founder of Boingo Wireless Inc., a Cometa rival. “It’s hard to translate success from one industry into success in another.

- As the giants struggle to adjust, they will face swarms of upstarts that enjoy powerful advantages. The newcomers carry no baggage from the old days, and they have the chance to sprint ahead (opportunity) on the strength of one breakthrough idea.
  - Who figured out the PC? Not minicomputer makers, but Apple Computer Inc.
  - Who mastered the Web? Upstarts such as eBay Inc. and Yahoo.

“Big companies cannot really see beyond their current customer base,” says Nicholas Negroponte, chairman of Massachusetts Institute of Technology’s MediaLab (the case of information error by way of loss of observation integrity). “This is why most new ideas come from small companies that have nothing to lose.”

# WIRELESS

- Finally, serious cell-phone capabilities and services are rolling in. Imagine your next phone as a TV, Radio, and Videocam.
- Huge cell-phone market is pushing media companies and software developers to develop new technologies for mobile phones.
  - ABC is offering video clips for Sprint cell-phone subscribers.
  - National Public Radio is delivering segments of *Morning Edition* and other shows to AT&T Wireless customers.
  - Yahoo! Inc. is working on ways to make as many as 100 channels of Internet service available to cell-phone users.
  - Walt Disney Co. plans to offer short, animated videos featuring Mickey and the gang.

(Ref. “How convergence is transforming the tech industry, Special Report in Business Week, Asian Edition, June 21,2004, pp. 51-73)

# The New Wireless Revolution

- A wave of innovation is coming to the cell-phone world. Thanks to faster networks and phones with more memory and better screens, people will soon use their handsets to watch TV, listen to music, and shop. Here is a look at what's hot (year 2004 information):
  - Stars of the small screen:
    - Pioneers are using their cell phones to show video clips from CNBC and College Sports Television. AT&T Wireless and Sprint offer the services to their subscribers for \$5 to \$20 a month.
  - Talk Radio
    - Wireless phones are doubling as radio receivers. Sprint customers can listen to Major League Baseball games for \$10 a month, and AT&T Wireless subscribers can hear National Public Radio reports for \$5 a month. Yahoo! plans to make at least some of its 100-plus stations of Net radio available to cell-phone customers.
  - Location, Location, Location:
    - For \$3 a month, AT&T Wireless subscribers can have satellites track the exact location of their phone. That makes it easier for emergency crews to find people who need help. It also lets customers in unfamiliar locales get directions to the nearest restaurant or movie theatre.

# Korea: The Wireless Frontier

- South Korea leads the world in cutting edge wireless services. Here is a look at life on the frontier (Year 2004 information):
  - Watching TV:
    - Can't get home in time to watch your favorite show? That's no problem for Koreans, who use mobile phones to view an array of TV programs.
  - Listening to music:
    - New cell phones from Korean companies like Samsung and LG double as MP3 players that store hours' worth of digital music.
  - Checking traffic:
    - Closed-circuit cameras located along highways and city streets beam images of traffic directly to wireless phones.
  - Balancing the books:
    - Wireless online banking is one of Korea's hottest trends. People use cell-phones to check real-time stock quotes, trade securities, and transfer funds.

# SERVICES

- To stay competitive, companies are finding new ways to automate operations, reuse technology, and streamline processes.
- Creative pressures
  - While outsourcing is a necessity for most tech-services' outfits as a measure to trim costs, it's not the only way. Smart companies are coping with creative pressure to reduce their labor costs by further automation of informational work through more software development – and not just by doing a lot of work in low-wage countries.
  - Example from Accenture:
    - To reduce labor and shorten the time it takes to install complex software packages, Accenture has created reusable programs that are customized by industry. An application for the insurance industry, for instance, now takes 9-12 months to get up and running, down from 24 months.
  - Example from IBM:
    - Big Blue is rolling out new automation technology in the first of its 342 data centers. Instead of engineers manually loading, testing, and maintaining the gear, much of the work is done automatically. It now takes just hours to install new software on some 100 servers, compared with 5-10 days in the past.

- Example from INFOSYS:
  - The Indian company has a library of reusable software modules based on Web-services technologies. Rather than writing code from scratch, engineers select pre-made modules and snap them together. This reduces the labor in a project by 10%.
- Example from Wipor:
  - Also from India, the company has written a software program that automatically translates documents from six European languages into English with 90% accuracy. The company figures that has saved it the expenses of hiring as many as 150 translators.
- Example from UNISYS:
  - It has built 14 “blueprints” that handle most of the basic business processes for key industries, including transportation and insurance. On the top of that, it adds functionality from a menu of 3000 software components. For ING, it built life insurance and pension applications in less than 12 months.

# IPOs: OPPORTUNITIES BEYOND GOOGLE

- It's not just Google. Plenty of prospective INTERNET IPOs are packing profits- and there is lots more where they come from.
  - To elaborate, after along hiatus, the IPO market for Web companies is back, with five deals completed in 2004 and 21 more in registration (the year 2004 statistics). That's up from 14 deals between 2001-03. But not every IPO is worthy. A guideline:
    - In the year 2004, more than 61% of Net IPO candidates are profitable, compared with 4% from 1998-2000. All the rest are cash-flow positive (Year 2004 statistics).
    - Four IPO candidates are driven by the surging market for Internet search advertising, which grew 183% in 2003, to \$2.6 billion (Year 2004 statistics). Besides the favorite, Google, there's Advertising.com, Claria, and Shopping.com.
    - Chinese Net companies are plentiful, profitable-and cheap.
    - A bust-burned market is cold to underperformers.
- (Ref. "How convergence is transforming the tech industry, Special Report in Business Week, Asian Edition, June 21,2004, pp. 51-73)

# SAID DIFFERENTLY

# IMPACT OF CONVERGENCE SAID DIFFERENTLY

- Ref.: “The blood of incumbents”, in *Make it simple - A Survey of Information Technology* by Andreas Kluth, The Economist October 30<sup>th</sup> 2004, After page 54 pages 15-16.
- Where does that leave the IT, consumer-electronics and telecoms industries today? Many of their current products have far overshoot the needs of businesses and consumers, yet failed to help them to get essential jobs done. Moreover, billions of analogues will eventually become digital immigrants, whether for fear of social isolation in rich countries or, in developing countries such as India and China, because they will be able to afford to. These current non-consumers are technology's next frontier.

# IMPACT OF CONVERGENCE ON IT

- For corporate buyers of IT, it has become clear in the past three years that their ability to “get jobs done” no longer has much to do with the power and complexity of their computers. Instead, they are increasingly finding that the simplest way to keep track of customers, bills, inventories and so forth is to rent such services for a monthly fee.
- This suggests that application service providers (ASPs) such as Salesforce.com, in their business models as well as in their technologies, could become disruptive simplifiers at the expense of today's enterprise-software giants.

# IMPACT OF CONVERGENCE ON CONSUMER ELECTRONICS

- For consumers, it is increasingly clear that coping with information overload is a big “job to be done”. Google has already acted on that observation by disrupting various old-fashioned owners of directories, such as Yellow Pages. Having moved well ahead with its own sustaining improvements, Google (or a firm like it) stands a chance of becoming a disruptive simplifier at the expense of incumbents such as Microsoft, which does not let consumers store information by content across all applications, making it harder to get at.

# IMPACT OF CONVERGENCE ON TELECOMS

- In telecommunications, mobile phones have for years been disrupting the incumbent fixed-line providers, but now they themselves are in danger of overshooting. Capgemini, a consultancy, has found that most mobile-phone operators vastly overestimate the importance that customers place on premium services, while equally vastly underestimating the importance of simplicity, both in handsets and in pricing plans. This is opening the door to disrupters such as Comviq, in Sweden, which has taken 39% of market share away from the incumbent, Telia, by offering half as many handset features and radically simpler pricing plans.

- Wireless and fixed-line telephone companies may simultaneously become vulnerable to new providers of internet telephony or VoIP, such as Skype and Vonage, or networking companies such as Cisco (especially once fast, wireless internet access has become ubiquitous and totally reliable). The disruption could be especially severe if the upstarts not only make calling dirt-cheap or free, but also find ways to help consumers with jobs such as simplifying their communications as a whole or meeting their needs for privacy.
- For incumbents this ought to be reason for paranoia, but it need not spell doom. If they play their cards right, they too can take part in the game of disruption—as AT&T, for instance, is trying to do by withdrawing from the residential telephone market at the same time as vigorously marketing its own VoIP service. The key will be to aim for simplicity and affordability.

# EMERGING BUSINESS PROCESSES

- Everybody else, meanwhile, has cause for optimism. A lot of things that are complex today will get simpler in the coming years. Like other technologies in history, IT and telecommunications seem destined gradually to recede into the background of human activity, leaving more time and energy to get on with the infinite complexities of business, and of life in general.
- To elaborate one can further detail impact of convergence particularly on services.
- As explained, services companies are under intense pressure to coax more productivity out of their staffers. After growing only 3% per year from 2001-03, the \$520 billion worldwide industry seems poised for a rebound. Bernstein Research expects the market to grow an average of 6.6% through 2004-10 (the year 2004 statistics; refer; “How convergence is transforming the tech industry” Business Week, June 21, 2004, pp. 51-73).
- Yet, because competition is fierce and customers still hold pricing power, tech-services companies must cut labor costs to gain market share and improve their margins.

- Longer term, these new labor-saving techniques are part of the evolution of services into a more mature industry. Some academics and tech-services companies even aim to create a new intellectual discipline- a science of services that merges business management, computer science, and sociology.
  - The idea is that IT professionals can study subpar business operations, come up with better ways of doing things, and –without an army of helpers – use a combination of technology and brain power to jazz up the client’s financial performance.
  - This work requires new skills. Until now, most IT professionals were trained either in computer science or business management. The business consultant typically focused on strategies and left technical decisions to the software or network architects. Now companies and colleges are teaching people to understand both business and technology.
  - The new breed of consultants needs the skills to quickly complete routine tasks with reusable software programs, standardized work processes, or cookie-cutter services. Then “the humans can apply more of their creativity to the piece that only humans can do,” says David F. McQueeney, a vice-president for technology at IBM Global Services.

- This transformation (i.e., shift) is well under way inside the top tech-services companies. In fact, there's no turning back. In the old days, consulting outfits billed by the hour. They would get more money if they had to call 20 more consultants to design a supply-chain management system. Now they are penalized if they assign more people to a job. That's because, these days, only 20% of consulting contracts are billed by the hour, compared with 85% four years ago, according to market researcher IDC (the year 2004 statistics). The majority are performance-based deals. Tech companies get paid based on their customers' achieving specified improvements in efficiency, cost-cutting, or revenue growth. The customer pays the same price whether it takes 10 or 100 people to do the job.
- The above shift has service companies scrambling to come up with ways to get more bang out of the intricate systems they create for clients.
  - Example 1: IBM Global Services, for instance, worked with British insurance company Norwich Union to create a pilot program, called Pay As You Drive, for monitoring individual car owners so their insurance rates can be based on how they actually use their cars. Devices in the cars monitor where they are and how fast they are going, then transmit the info wirelessly to Norwich's server computers- which evaluate risk and send out bills. This is complex stuff, and IBM might not make profit if it was a one-off deal. So now it's peddling much of that to a number of insurance and automobile companies.

# EPILOGUE

## USHERING OF DISRUPTIVE PERIOD IN BUSINESS CYCLE

# EPILOGUE-1

- Recognize following environmental anomaly:
  - Dell Inc. selling flat screen TVs,
  - Microsoft unveiling a system to compete with the iPod that plays movies as well as music,
  - Cisco Systems Inc. hawking a Wi-Fi boombox you can carry anywhere,
  - Japanese TV manufacturers and Korean cell-phone makers rigging their products with microprocessors and software,
  - Sony in India producing TV entertainment software,

For survival and growth, nearly everyone is venturing far from their specialties.

(Ref.: Business Week, Asian Edition, June 21, 2004)

# Epilogue-2

- Since mid eighties (i.e., 1984-85), anticipation of the coming converging digital technology age,
- Almost twenty years later (i.e., by 2004), the anticipation becoming reality. Observe:
  - The market for personal digital assistants, so hot in the late '90s, is vanishing as customers get the same functions in a cell phone-often with a camera to boot.
  - Latest TVs from Royal Philips Electronics and Sony Corp. possess enough computing firepower to extract (receive) streaming video off the Net.
- Anticipation is becoming reality mainly due to: Faster chips, Broader bandwidth, and a common Internet standard.

# Epilogue-3

- Convergence is of computing, consumer electronics, which is further powered by content, and communications.
- Through this convergence, digitization is creating products that cannot be categorized as technology or consumer electronics.
- The walls are coming down.

# Epilogue-4

- In concrete terms, collision of three massive massive industries:
  - \$1.1 trillion computer and software industry, with its American leaders (Computing technology),
  - \$225 billion consumer-electronics industry sector, with its strong Asian roots and host of aggressive new Chinese players (Consumer electronics technology further strengthened by production of content), and
  - \$2.2 trillion communications industry that extends from wireless powerhouses in Asia and Europe to the networking stars of Silicon Valley (Communications technology).

# Epilogue-5

- All three groups needed to build digital supports and services that customers marvel and long for,
- But none of these industries, much less a company, can put all pieces together. They all need help.
- For this thy venture into adjoining territories, where they forge new partnerships and take on new rivals.

# Epilogue-6

- The result is a Big Bang of convergence, and it is likely to produce the biggest explosion of innovation since the dawn of Internet.
- From global powerhouses such as Samsung Group, IBM, Microsoft, and Hewlett-Packard to lesser-known players such as Taiwanese laptop king Quanta Computer and Hong Kong display maker TPV Technology, all are busy crafting strategies for convergence.

# Epilogue-7

- All this will lead to thousands of of new computerized products and network services. Most will flop (can this rate be reduced? What does it need?).
- But a few breakthroughs are sure to take off (can this rate be increased or rather maximized? What does it need?), giving birth to new technologies and changing the way we live and work.

# Epilogue-8

- Hossein Eslambolchi, president of AT&T Laboratories, thinks the changes ahead will be as significant as the advent of commercial aviation in connecting people and communities. “This is going to be the most disruptive period in the past 50 years,” he says.
- (Ref.: Business Week, Asian Edition, June 21, 2004)

**THANK YOU**