

Four Convergences and a Trade Funeral?

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“Convergence” has been a Buzz word for a long time. Is it finally happening, and how? My conclusion is that much of it is happening rather sluggishly, and that the digital convergence that is happening instead of creating bridges, may create trade wars; instead of creating harmony and harmonization, it may create disruption and disagreement.

Let us look at the American experience. In the US, the Telecom Act of 1996 was supposed to accelerate convergence by letting previously separated industries to compete with each other.[cite Act] The reality, however, has been more modest. To see this, let us differentiate among four different types of convergence. The first is the convergence of *delivery technologies*. Cable TV was going to enter telephony, local telecom companies were expected to invade into long distance, and vice versa, and TV was going to enter digital multimedia, with text and data. But so far, less has happened than expected. Cable’s entry into voice telephony has been slight, mostly pursued by the firms Cox and Cablevision. It took AT&T’s (the classic phone company) to energize this entry, through its 1999 acquisitions of TCI and Media One. telecom firms had even less success in video delivery, and even where a telecom firm, US West, owned a major cable TV network for a time, it did not integrate its telecom network with its broadband video furthermore, by the middle of 1999, no Bell company had yet been admitted to long distance service, and when they finally are, they will face entrenched first and second-generation rivals

with a substantial head-start. At the same time, long-distance companies have entered local telephone service less by construction and, mostly by acquisition. WorldCom bought MFS, and AT&T bought TCG and TCI. All failed in entry through infrastructure or simple resale. Altogether, new entrants hold only a tiny share of the local access market (about 3%) and even less for residential service. The digitalization of terrestrial broadband TV, essential for convergence, has just started, but penetration will be miniscule for at least 5 years. The sets are expensive, there are few programs, and there are presently no advertising revenue streams, only costs. Thus, the convergence of delivery modes is making only slow progress.

The second type of convergence is business convergence: mergers, joint ventures, alliances, etc. And here, too, the reality has been modest. Of course there have been numerous media mergers, but few of them have been convergence mergers. There are virtually no TV companies in the telecom sector, or vice versa. The main exception is the AT&T/TCI merger (of course, a very big exception) and Microsoft's efforts in cable TV and in the firm Web TV. But these two types of Microsoft investments and their price make no obvious sense, except that they may show that Bill Gates is now having more money than places to park it. . It combines synergistically with the technological strength of US firms in server technology and cyber TV. And with the desire of large transmission carriers to have tenants to assure capacity utilization, which will get them advantageous rates. If anything, existing media conglomerates will actually dis-integrate and become focused. The argument of synergies has rarely been backed up with data.

The third convergence is that of regulation. Here, too, little convergence happened in the U.S. following the 1996 Act. The FCC has created something called Open Video Platform, but this status has one option among three, and has been rarely selected by the carriers. In fact, only

one company uses it. The FCC has also established a treatment of broadband digital subscriber loop by telecom carriers that is distinctly different from that of cable companies, (Section 706) [cite] and has refrained from imposing on the latter equal access requirements for Internet service provision that phone companies must follow (AOL petition). [cite] The common policy principle behind this approach is to accelerate and protect the emergence of local telephone competition. And because such competition will take time to emerge, the future may see a continuation of asymmetric regulations, because there are not enough degrees of freedom in the regulatory tools to harmonize across all situations.

Does this mean that everything will be the same? No, to the contrary. Because there is a fourth convergence - the convergence of the Internet and telecommunications. Increasingly, ISP backbones are run by telephone carriers. For instance, GTE now owns BBN Planet, Worldcom owns UUNet, and parts of MCINet, with Cable Wireless acquiring the rest. Sprint has had backbone for a long time. AT&T bought IBM ????. And now, a whole new set of carriers is emerging, that is a hybrid of long distance phone carrier and backbone provider such as Level-3, Qwest, Williams, Metromedia, etc. These carriers provide mostly IP service. They are on the leading edge of transforming networks from circuit-switched to packet-switched, i.e., engineered primarily for data rather than voice. And because of the enormous growth of demand for Internet transmission of greater reliability and latency, the capacity increases provided by the new carriers, as well as their traditional competitors, is enormous. This convergence, of Internet and telecom, has major implications. First of all, we will move from scarcity to over-capacity in capacity. The conventional wisdom today is that of inadequate network capacity, slowing down, in particular, the evolution of the Internet. Some of this is true, but not for long. First, economics

comes to the rescue. For historic reasons, the Internet emerged largely outside the market system, the closest brush with socialism the US has ever seen. In the absence of price signals, supply and demand rarely coincided. However, with demand rising and bottlenecks in supply, market actors will invest to meet the needs of the market, and make profits.

In addition to the fact that that market clearing prices will take care of part of the congestion problem, technology change comes to rescue. Simply put, the decade of the 90s was dominated by the revolution in processing power, based on fundamental VLSI technology advances of the 80s. For a while, transmission could not keep up with processing, because it was much more expensive to widen the channels than to add more powerful chips, and therefore bottlenecks emerged. But in the next decade, transmission will be the driver instead of the brake. Take a look at the projected capacities of US networks, with its new 3rd generation carriers such as Level 3, Qwest, IXC, ICG, or Williams. (EXEMPLIFY WITH SIZE.) Add to these new carriers the capacity of the established first and second generation carriers that are also busily expanding, (EXEMPLIFY.) plus the Bell companies that are going ahead. All of them are using fiber whose capacity is increasing enormously. Wave division multiplexing has reached now almost 100 windows, erbium doping amplification technology is increasing throughput multi-fold. Together, these lead to extraordinary capacities. Experimentally, NEC has reached 3.5 terabit per second per fiber strand. Suppose that the off-the-shelf technology in 5 years will be just half of that, 1.7 terabit per second. Suppose that a conduit holds 144 such strands, which is Level 3's plan. Suppose further that the companies who will offer such strands between cities are AT&T, MCI, Sprint, an RBOC, 3 new-type carriers, and a cable company, and add to that a bit of capacity from 2 satellite providers and one terrestrial wireless company. That amounts to a

national network of 2.2 Petabits per second. Divide this by the number of households, and it comes to a per household capacity of 20 Megabits per second, which is enough for over 10 compressed video channels, simultaneously, for every American household, each watching something entirely different. This is certainly enough for a lot of residential Internet access. Now even if one scales down this calculation by some magnitudes, there is going to be a tremendous capacity out there. Of course, this is long distance backbone capacity, but the local capacity will grow with it. DSL, FTTC, HFC, LMDS, blimps, balloons, HALO aircraft, whatever. (DEVELOP LAST SENTENCE INTO REGULAR SENTENCE AND EXPAND ESPECIALLY ON LOCAL ACCESS BOTTLENECKS.)

Therefore, the first decade of the 21st century will see vast increase of transmission capacity. The concern about bandwidth shortage at the end of the 20th century will seem like the talk at the beginning of the century whether there will be enough women in America to staff all those manual switchboards.

And what will be the impact of this capacity? The most obvious one is that price drops and that basic transmission becomes commodity. This will happen in domestic traffic and also in international traffic, where new submarine cable projects, GEOs, and LEOs will raise capacity to unheard levels. Per-circuit cost will drop, marginal cost will be negligible, and prices will become low, capacity based, and flat.

What are the impacts of near-zero priced long distance for domestic and international traffic? What will it be used for, and by whom? First, consider the impacts on TV media: Whenever a new media technology comes along, people talk about schools and hospitals and libraries. But if the experience with mass media means anything, then abundant cheap

communications will be used, to a considerable extent, for *entertainment*- films, games, sports, adult programs. Many of these can be delivered in the traditional ways of broadcast and satellite, but the new transmission capabilities will permit interactivity which in turn will facilitate customization and personalization of watching, and even more interesting, of advertising. Video servers at a distance become possible, and push technology will become a quasi-broadcast medium especially for ads. (EXPLAIN WHAT PUSH TECHNOLOGY STANDS FOR.) This does not negate traditional modes of simultaneous TV-watching by millions of a few programs, but it adds the option of individualized viewing of millions programs. In that fashion, a step beyond narrow-casting is taken, that of *person-casting*. We will get Me-TV, Kanal Ich, and Canal-Moi, etc. Just as with narrow-casting, the need for all this diversity will be derided at first. However, if individualization is not warranted by demand, why then do we have video stores? Why has the video rental market developed so much if not to satisfy some actual needs? Cable TV will continue to play a role, in particular that of a last mile providers. Moreover, headends will consolidate and become large and distant headends, storing many programs at increasingly far away locations. This will happen since the need to have local headends is purely the result of the cost of transmission costs, plus franchise regulation. If transmission costs drop to near zero, headends will consolidate to national and international locations like satellites today.

In that environment, who will gain? *Hollywood*. With distribution cheap, premium content becomes king, queen, and emperor. Hollywood firms will distribute their products from big video servers which they or their wholesale allies will run. It combines synergistically with the technological strength of US firms in server technology and cyber TV, and with the desire of large transmission carriers to have anchor tenants to assure capacity utilization, which will get

them advantageous rates. What this means is that this form of TV will be strongly American in content and ownership. It will bypass the traditional gatekeepers of national TV stations and networks, and of national regulation by licensing. Zero-cost global transmission leads to a great rise in electronic transactions with great consequences on business. Of course, traditional ways of doing business will not disappear, just as the mom-and-pop store did not vanish when supermarkets emerged. But the energy and dynamism will be in electronic modes of commerce. And here, too, it will be US firms that will be most successful. They will be technologically at the leading edge, with risk capital at their disposal, with the advantage of early entrant, and a large home market. Once a firm establishes a successful model for the US market, and once transmission price is near zero, there is no reason to stop at the border.

What this discussion shows, so far, is that US firms are likely to capitalize first and strongest on the transmission abundance. It suggests that US strength in this area will, if anything, increase. This is not something people like to say or hear. More common is the rhetoric of the global brotherhood of the Internet. Despite all evidence to the contrary, most Internet advocates, good internationalists almost by definition, deny that the Internet is a deeply American medium in ownership, usage, style, technology. Sure, one can always point to some Europeans on some Internet boards, or to the fact that more Finns per capita are connected to the Internet than Americans. So what? Heard any good Finnish music lately over the Internet? Let's not confuse demand with supply. However, it is not due to a conspiracy that US firms will become even stronger world wide but it is a reflection of a confluence of strengths which exists in America: content; hardware; software; investment capital; high-tech universities; tele-marketing firms; a vibrant cable industry; language; and the immigration of vast talent.

There is the cultural power that comes with being a superpower, and a multi-culturalism that helps to create content for the world. And there are transmission carriers that have been subject to greater competition and performance pressures than elsewhere, and for a longer time.

How does all of this add up? For a start, there will be a lot of losers, and not only winners. Joseph Schumpeter called this the creative destruction of capitalism. It is characteristic of losers to organize themselves politically better than the winners, because they tend to be established. It's always hard to fight modernism, and it helps if the winds of change can be identified with a foreign country. And therefore, as the changes in economic and social patterns caused by cheap information flows will strengthen the US role and weaken that of some other countries, there will be an inevitable backlash.

One can see these tendencies already: In the fights over privacy [cite]where some countries require domestic certification agents, instead of a mutual recognition, in a protectionist vein. On the domain name issue, where international belly-aching led to a change in the system and portends other attempts to bring in governance into some supra-government system. [cite] On the continued discussions over "national culture" quotas and other forms of protectionism that exist in Europe and North America, and that will only expand their scope.. Thus, we should be skeptical whether one can expect continued world wide liberalization of e-commerce and cyber activities if one country gains disproportionately. There will be more restrictions on e-commerce rather than less.

It is easy to criticize other countries' restrictions on e-commerce in the abstract.[cite US Gov report (magazines)] But imagine the response in the US if we had a thriving entry by Albanian tele-doctors, Thai child pornographers, Monaco tele-gamblers, or Nigerian blue-sky

stock ventures. Each society has a variety of values and interests, for better or worse, which underlie its legal arrangements, and it is not going to drop them just because the new activities are done over computer networks. It is naive to think that the Internet will be a libertarian island in a society that runs on some rules.

Many people deny this likelihood by clutching at technological determinism they argue that even if one wanted to, one simply couldn't regulate the Internet. After all, even kids can run electronic circles around flat-footed, heavy-handed government regulators. This is wishful thinking. Of course one can regulate the Internet if one wants to. Maybe one can not reach the electronic transactions themselves. But communications are not just about bit streams and transactions, they involve nodes-- people and institutions with domiciles and assets. If one cannot catch the mobile parts of this system, one go could after the least mobile, such as physical delivery, people, transmission facilities, or assets. This may not be an elegant approach, but neither are the income taxes or the traffic laws.

What is the conclusion?

The next decade will see the impact of the death of distance that is caused by the radical increase in transmission capacity and the radical drop in transmission prices. All this will have enormous impacts on just about any societal institution. In this transformation, a few countries, especially the US, are gaining disproportionately. Other countries try to accelerate their own transformation, but it will not be easy to catch up. The Developing World, for all the talk about its telecom reform, is actually falling further behind once one moves beyond dumb telephony. They could add to their own transmission capacity but that might only open the highways to Americans. Or they can wait for the US to choke on its change, to glut itself in information. This

will happen and will be the long-term corrective, but it will take a long time.

Instead, the easier route is to slow down the winners, and to do so collectively. And this will lead to future cyber trade-wars. Thus, digital convergence, instead of creating bridges, may create trade wars; instead of creating harmony and harmonization, it may create disruption and disagreement. The question therefore is, how can one reduce incentives? How can one prevent this curse of success? How can one let the rest of the world have more of a stake in the changes than in the status quo? How can one create the fifth type of convergence that of global electronic development, so that other countries will be net winners, too? Because only if a global electronic convergence of development happens will avoid the specter of future cyber trade-wars.