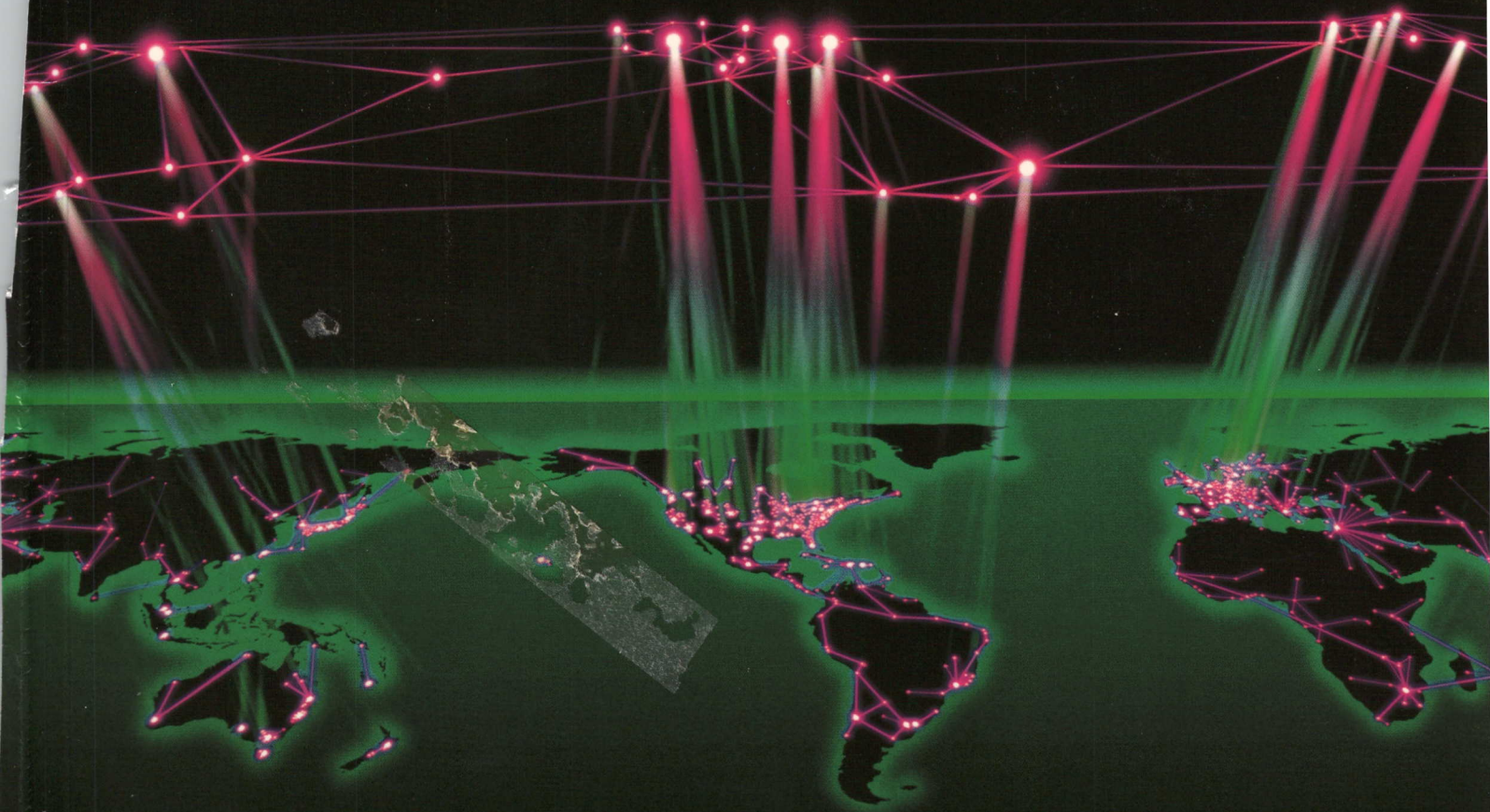


JANUARY 1999

GLOBAL ELECTRONIC COMMERCE

The Next Phase



INCLUDES THE
CONCLUSIONS OF
THE OTTAWA OECD
MINISTERIAL
CONFERENCE
OCTOBER 1998

- *OPTIONS FOR RETAILERS
- *DAWNING OF THE TAX-FREE AGE
- *BUILDING TRUST
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& MARIO MONTI ON HIS
PROPOSALS FOR THE EU

THE COMING OF CYBER-TRADE WARS

by Professor Eli Noam, Director of the Columbia Institute for Tele-Information



The conventional wisdom about Internet network capacity is expressed by the dismissive term of the World Wide Wait: that is, of inadequate network capacity slowing down the usage and the evolution of the Internet. Much of the blame is then assigned to a bunch of Bellheads, still running the phone industry, still not getting it, still not moving fast enough in the dawning cyber-age to keep up with the cyber-age, but still in the way. It's their antique, circuit switched, twisted pair, twisted mind architecture, their cobwebbed monopoly utility mind set, that are supposed to be the problem. Why otherwise couldn't one get a 64 kbps ISDN line as readily to the home as a 56 kbps modem?

Some of this is true. But to jump to the conclusion that it's all individual and institutional failing that accounts for congestion is to miss the problem. First, there is that pesky matter of economics. 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. Now, like teenagers discovering sex and believing that their generation has invented it, the Internet community has got back to markets, with a vengeance.

It is true that market clearing prices will take care of part of the congestion problem. But soon, the issue of congestion will be set on its head. 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 couldn't 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, third generation carriers such as Level 3, Qwest, IXC, ICG, Williams. Add

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them to the capacity of the established first and second generation carriers that are also busily expanding. Plus the Bell companies champing at the bit. All of them are using fibre whose capacity is increasing enormously. Wave division multiplexing has now reached almost 100 channels. Erbium doping technology is increasing throughput multi-fold. Together, these lead to extraordinary capacities. Experimentally, NEC has reached 3.5 terabit per second per fibre strand. Suppose that the off-the-shelf technology in five 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 that the companies who will offer such strands between cities are ATT, MCI, Sprint, an RBOC, three new-type carriers, and a cable company. Add to that a bit of capacity from two satellite providers and one terrestrial wireless company. That amounts to a national network of 2.2 Petabytes 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 several 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, it's still clear that there is going to be an awful lot of capacity out there. Of course, this is long distance capacity, but the local capacity will grow with it. DSL, FTTC, HFC, LMDS, blimps, HALO aircraft, whatever.

Therefore the first decade of the Millennium will see a vast increase of transmission capacity. Vast isn't even big enough a word to encompass what will happen. The talk about bandwidth shortage at the end of the twentieth 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 American impact of this capacity?

The most obvious one is that price drops. Basic transmission becomes commodity. This is true for domestic traffic. It's also true for international traffic, where new submarine cable projects, GEOs, and LEOs will raise capacity to unheard levels. Per-circuit cost drops, marginal cost is negligible, and prices become low as well as flat, instead of high dual usage-based. Or, more accurately, prices become capacity based and flat.

Now what are the impacts of near-zero price long distance?

This is the 64 trillion dollar question for the twenty-first century. Suppose that international calling becomes low and flat, what then? What will it be used for, and by whom? Let's explore that.

First, let's look at TV media.

Whenever a new media technology comes along, people talk about schools and hospitals and libraries, but the reality is rarely as ennobling. A few years ago, someone was accused in Columbus, Ohio, of distributing pornography and violating community standards. He subpoenaed the viewing records for the Columbus addressable cable system, which showed that the most frequently watched programme in a certain evening time slot was *Captain Lust*. The least watched programme, on the other hand, was *You and the Economy*, featuring a panel of economics professors, and seen

by exactly three households, one of them probably a panelist's mother.

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 programmes, etc. Many of these can be delivered in the traditional ways of broadcast and satellite, but the new way permits interactivity which means customisation and personalisation of watching and – even more interesting – of advertising. Video servers at a distance become possible. Push technology will become a quasi-broadcast medium especially for ads. This does not negate traditional modes of simultaneously watching by millions of a few programmes, but it adds the option of individualised viewing of millions of programmes. In that fashion, the step beyond narrow-casting is taken, that of person-casting. Me-TV. Kanal Ich. Canal-Moi. Just as with narrow-casting, the need for all this diversity will be derided at first. But if individualisation is not warranted by demand, why then do we have video stores? Cable TV will continue to play a role: that of a last mile provider. Cable modems will be a big business, and headends will consolidate and become large and distant headends, storing many programmes at far away locations. The need to have local headends is purely the result of the cost of transmission costs, plus franchise regulation. Drop transmission costs to near zero, and 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 is a logical role for vertically integrated Hollywood firms to play. It fits with their presence in theatrical exhibition, videostores, and TV networks like ABC. 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 utilisation, which will get them great rates.

What this means is that this form of TV will be strongly American in content and ownership. It can bypass the traditional gatekeepers of national TV stations and networks, and of national regulation by licensing.

The impact on business transactions

Zero cost global transmission leads to a great rise in electronic transactions. Of course, traditional approaches do 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 entry, and a large home market. Once you establish a successful model for the US market, and once transmission price is near zero, there is no reason to stop at the border.

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What this discussion shows, so far, is that US firms (and Canadian perhaps, if they play it right) will be able to capitalise first and strongest on this transmission abundance. It suggests that US dominance in this field will, if anything, increase.

Now this is not something that one brings up in polite society. More common are the type of unconvincing rhetoric of the type that abounds in Washington and Silicon Valley. Despite all evidence to the contrary, most Internet advocates, good internationalists almost by definition, deny that the Internet is a fundamentally and deeply American medium in ownership, usage, style, technology. This may be better than some alternatives, such as a kind of global minitel run by telecom monopolies. But it is pointless to deny the fact of US dominance, because other countries are not stupid. Sure, one can always point to some Europeans on some busybody Internet boards, or that there are more Finns per capita on the Internet than Americans. So?

I've come to this conclusion reluctantly. I'm travelling abroad at least once a month. I have just completed a book, *Telecommunications in Africa*, that followed my *TC in Latin America*, *TC in the Pacific*, *TC in Asia*, and *TC in Europe*. So my conclusion is not from ignorance of the

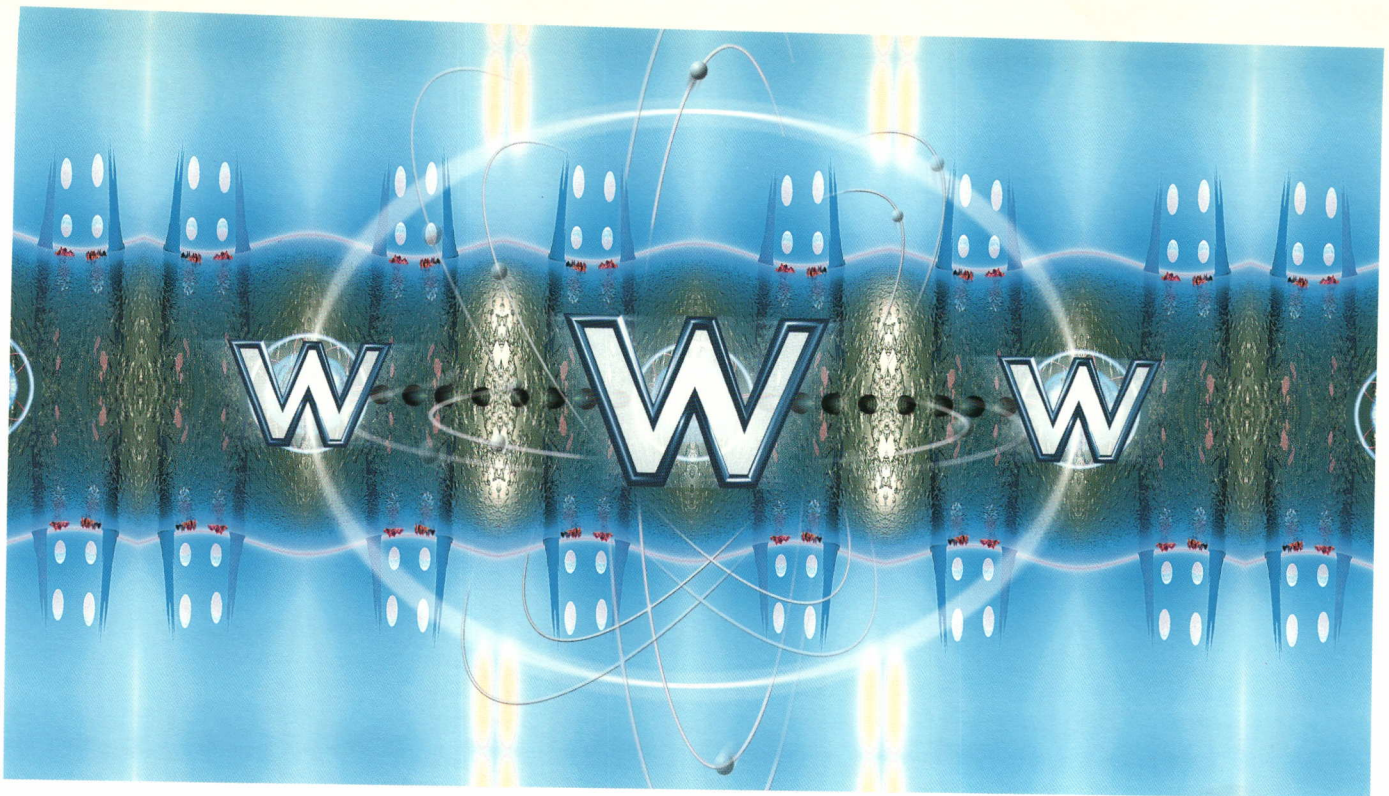
world. But it is also not based on the frequent wishful extrapolations one hears that are based on some visitors' non-random encounters in another country with people who exist several standard deviations away from their own societies.

If abundant transmission is giving US firms an enormously stronger role worldwide, it is not a conspiracy: it is a reflection of a confluence of strengths which North America possess. There is content, Hollywood. There is hardware, Silicon Valley. There is Software, Redmond and elsewhere. There is capital, Wall Street. There are universities. There are tele-marketers and mail-order firms with an aggressive track record. There is language. There is immigration of vast talent. There is the cultural role that comes with being the superpower. There is 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. One does not have to be vastly superior to other countries and companies to succeed. All one needs is to be a bit faster than the other guy to survive and prosper.

Impact on education

This can be extrapolated to other activities. Take higher education. The traditional university system goes back 2,600 years to Nineveh. It was stable since then, but will not stay that way. Then, the royal library was divided into various rooms, each for an area of knowledge such as astronomy, history, or agriculture. In those rooms sat the scholars, using the information and adding to it. They were surrounded by their adoring disciples, their jealous colleagues, and their penny-pinching administrators. It's been like that ever since. The basic principle was that information is scarce, that it needs to be stored and shared, that scholars come to the information, and that students come to the scholars. But now, information has become abundant, and it can be anywhere. Therefore, scholars can be anywhere, linked to each other, and the students can come to the scholars electronically. This does not mean that such a form of education is superior to face-to-face. But the point is that it can be delivered at much lower cost, and at greater convenience.

And who will do the main delivery? Again, US providers will be at the forefront. American universities, of which there are a large number, are used to



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competing with each other for students and faculty and resources. They have become the major world exporter of higher education, despite the high price tag. With electronic distance education, they could branch out globally. I am now offering a course in media management over the Web to a major Swiss business school, from the comfort of my Columbia office. It's a major effort to develop, but once done, it can be distributed not just to dozens of students here, but to thousands everywhere. In any event, it will not be traditional universities or their professors who will drive online education, but commercial firms such as publishers and new virtual universities that will be at the forefront. There are already several of them around, one financed by Michael Milken, the junk bond king. He has recognised education as a trillion dollar market run by amateurs.

What can other countries do about that? Prevent their students from taking a degree over the virtual Columbia? Prevent the recognition of such a degree? This works only as long as employers do not value these credentials in their job applicants. That is a thin reed to lean on.

Impact on e-banking

Financial flows are among the first to become global because the value added is high, speed is of the essence, and the product has no real physical dimension outside of a few gold bars which none ever sees anyway. Banking has always had strong international aspects, and electronics is making them stronger. With cheap international calling, home banking and all kinds of other transactions become even easier than before. Credit cards, cheque accounts – why bother with the physical connection? The last time I was physically in my bank branch was four years ago when I bought an airplane and needed a big certified cheque. Why then not transact through a distant bank, a foreign bank, a non-bank? Electronic money accelerates this tendency. There are efforts in that direction in several countries. It's perhaps useful to understand what e-money, coupled with cheap international communications, will lead to. Namely to private money, competitive money, issued by private companies like they did in the 19th century, with the role of the government limited to being the regulator of money rather than the issuer. Which is why the decision to move to the euro is such a step backward: to a supergovernmental super-currency, money for the industrial age, instead of moving forward to private, electronic, diverse high-tech intelligent money of the information age.

Implications for international relations

How does all of this add up? There will be a lot of losers. Joseph Schumpeter called

this the creative destruction of capitalism. Many established institutions will ignore the “creative” part of the term and focus instead on the “destruction” part, namely their own.

It is characteristic of losers to organise themselves politically better than the winners, because they tend to be big and established. Mancur Olsen traced these tendencies for Britain, explaining her rise and decline. It's always hard to fight modernism. But it helps if the winds of change, and the winners, 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 others, there will be an inevitable backlash.

One can see it already:

- ◆ in the fights over privacy, which pit an obsolete European model of data protection, based on 70s politics which was based on the fear of 60s technology of computer mainframes, against an insouciant American approach full of dinner-time telemarketing, automatic dialling, and data mining;

- ◆ on the issue of digital signatures, 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; and

◆ on the continued discussions over “national culture” quotas and other forms of protectionism that exist in Europe and North America, and that will grow as the number of losers increases. The French required servers in France to be in French. Who knows, next we will see requirements for servers to be in domiciled France.

Yes, there was a WTO agreement last year, reached after a decade of bargaining. But one must read beyond the self-serving political victory announcements, like President Clinton’s, who said that this agreement will add one trillion dollars to the world economy. With a close look one can see that there is virtually nothing in that agreement that the major countries had not already decided to do anyway, for their own domestic reasons. And now, the back-peddalling among some of the second-tier participants has already started.

I’m sceptical whether we can expect continued worldwide liberalisation of e-commerce and cyber activities if the US gains disproportionately.

Thus, there will be more restrictions on e-commerce, rather than less. And it’s easy for Americans to preach to the world, as the Administration has done, especially if the sacrifice is asked from other governments,

whether abroad or by the states. Let’s face it: if the US government really thinks that there should be no tax burden on Internet transactions, it could just drop the federal income taxes on these companies instead of grandstanding that there should be no state sales taxes.

It is easy to criticise foreign restrictions on e-commerce in the abstract. But imagine the response in the US if we had a thriving entry by Albanian tele-doctors; Thai child pornographers; Cuban cigar mail-order providers; Monacan tele-gamblers; and Nigerian blue-sky stock ventures. The point is that 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 totally naive to think that the Internet will be a libertarian island in a society that runs on other rules.

At this point, one tends to hear the assertion that even if one wanted to, one simply couldn’t regulate the Internet. After all, kids can run electronic circles around flat-footed, heavy-handed government regulators. This is usually accompanied by statements like “a bit is a bit” or “they just don’t understand the new paradigm”. All these assertions are wrong. Of course one can regulate the Internet if one wants to. Maybe not the electronic transactions themselves. But communications are not just about streams, they involve modes:

“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”

people and institutions with domiciles and assets. So if one cannot catch the mobile parts of this system, you go after the least mobile, such as physical delivery, people, transmission facilities, assets. This is not the perfect way to do it, but neither are the income taxes or the traffic laws.

So 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, including the basics, money, power, and sex. In this transformation, the US is gaining disproportionately. Other countries could accelerate their own transformation. They are trying, or at least, they talk about it. But it will not be easy to catch up. The Third World, for all the talk about its telecoms reforms, is actually falling further behind once one moves away from dumb telephony. One can help 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 – which will happen, and will be the long-term corrective. But that will take time.

Instead, the easier route is to slow down the winners, especially the US, and to do so collectively. And the question now is, how can one prevent this? How can we 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 openness and border-negating communications networks and prices and uses without leading to a neo-romantic, political Luddism that is presented as the alternative to electronic Darwinism? What kind of compensatory benefits can one offer other countries to keep them net winners, too? What are the real carrots one can offer? I believe that we should explore the answers to these questions. Because if we don’t know where we are going, we may actually get to the age of cyber-trade wars instead. ■