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Communications Technology in the Next Decade: Notes from a Computer Idiot

LADIES & GENTLEMEN.

Nearly six years ago, my wife and I left Hong Kong to return to the United States. We settled in November 1994 in northern Virginia near Washington, D.C. We bought a house and installed the IBM 386 PC we brought from Hong Kong. My wife, who grew up in Hong Kong, immediately bought a subscription to the New York edition of a Hong Kong Chinese daily newspaper, Sing Tao. It usually arrived in the mail a day or two late, often in packets of two or three daily issues.

The following January my daughter gave me a birthday present - a modem for our 386. Since I am a certified computer idiot, I was not sure what to do with it. But after coaxing from my technologically minded wife and daughter, they installed it for me.

I discovered E-mail.

Now, in my final days in 1993 and 94 in Asia, I was involved with communications technology in my capacity as vice president for the Asia-Pacific division of an American news agency, United Press International. The company was in distress and, in fact, dying. Saving money was important because UPI did not have any. I had heard that this new-fangled packet-switching offered an opportunity to save vast sums on communications. But bewildering confrontations with telecommunications monopolies in Pakistan and Thailand, for instance, left me puzzled how to achieve the savings. I did not even realize I was dealing with what was to become familiar to me as E-mail.

Once we discovered E-mail in the United States, we discovered the Internet.

My wife found she could read her favorite Hong Kong newspapers, in Chinese and on the day of publication, on the Internet in our own home. Out went the slow, out-of-date Sing Tao mail subscription.
And I, sitting in our study, discovered suddenly that I had communications power of the sort I experienced for the first time 40 years ago when I was a rookie editor on the Associated Press general desk in New York City. Using AP's dedicated message lines, I then could reach AP bureaus and reporters all over the globe in the 19-50s. But from my own home in the 90s, I could reach through Email and the Internet, just about anyone I wanted. Even more importantly, I could say anything I wanted on my own messages. I had as much power at my fingertips in my own home in 19-95 as I had as that young AP editor caught in a vast corporate network.

How many others were experiencing the same sensations. Quicker, more efficiently, more cheaply, the whole world was opened to us. And most of us never have looked back.

And here, we are trying to look ahead.

I am here as a representative of The Freedom Forum, an American-based public interest foundation devoted to the global news media and to the ideals of the First Amendment to the U.S. Constitution - freedom of the press, of speech, of assembly, of religion. We are nonprofit and self-supporting; we accept funds from no one. We belong to no government. We are nonpolitical and nonpartisan (except when it comes to free expression and free news media). Please understand -- we are deeply interested in keeping the paths of communication open to all.

I am still that same computer idiot, about to graduate -- with these remarks -- to becoming a technology idiot.

As director of The Freedom Forum Asian Center & Library in Hong Kong, I a standing in here for our eminent senior vice president for technology and programming. Unfortunately, he cannot be with us today.

Some colleagues have suggested he was right not to show up today in Chennai. They insisted the topic, Communications Technology in the Next Decade, is impossible. No one really knows what will happen during the next 10 years.

Maybe so. Let's hear what we can find out:

How about, by the year 2005, phone and high-speed internet access for all as high-bandwidth connections that easily move video become common. By that year, satellite projects will permit commonplace connections for high-speed Internet, telephone and video. Teen-agers in villages in Asia will chat on video phones as they surf the Net.

By 2010, Intel will build a chip with one billion transistors - 100 times the complexity of the most advanced integrated circuits designed now.

Or by the year 2015, a bit beyond our decade, simultaneous language translation will be common, made possible by those computer chips 100 times more powerful than the ones used today.

These are benefits of "The Long Boom." That is the title of futurist Pete Schwartz' prophecy that we are on the lip of what he calls a global economic boom on a scale never before experienced before.

Now this is a man whose San Francisco consulting firm includes among its client list the government of Singapore.

He is also the man who forecast in 1982 to Royal Dutch Shell the collapse of oil prices that prompted the company profitably to buy oil fields cheap when the collapse actually occurred.

But he is also the man who wrote just one year before - in 1981 - that oil prices would soar to 85 U.S. dollars a barrel. It didn't happen.
No wonder my senior vice president for technology did not show up. But take it from a technological idiot - true marvels are on the horizon.

How about Internet connections in cars (but before you swallow that one, remember those who predicted widespread use of television in cars - and then remember the growing use today in vehicles, of satellite positioning devices).

How about "teleportation." Kevin Maney, who writes about technology for the American national newspaper, USA Today, has reported that work is underway on transporting objects over wires and that one experiment included the successful transportation of a sub-atomic particle, a proton. Worth watching - although for you Star Trek fans, it's not "Beam, me up, Scotty," yet.

In the interests of full disclosure, you should know that the founder of USA Today, Mr. Allan Neuharthur, is also the founder of The Freedom Forum.

What seems more real is an interplanetary Internet. Vinton Cerf, considere to be the "father of the Internet" said last year that work was underway to extend the Internet to outer space. He is the senior vice president for MCI Communications Corporation. He said the Jet Propulsion Laboratory of the U.S. National Aeronautics and Space Administration (NASA) and telecommunications companies are seeking ways to create an orbiting Internet gateway to allow Internet-based communications between Earth and Mars - or other planets.

Or, to take the X-Files approach - to other beings in the universe.

Imagine: Dot Mars.

Or, how about the prospect of free telephone calls or voice messages, however they will be identified during this decade. More about that in a few minutes.

And about those chips from Intel. A chip will cost one U.S. penny.

And don't think only in terms of people communicating with other people. Listen to Dr. Andrew Lippman. He is the associate director of the Media Laboratory of the Massachusetts Institute of Technology, and this is what he says about the commonplace kitchen:

The kitchen is "begging for a network...Right now, your toaster doesn't talk to your television set. Your refrigerator doesn't talk to your stove. None of them talk to the store and tell you to get milk on your way home. It's an obvious place screaming out for connectivity."

"Screaming" may be the apt word here. When you next get home, go the kitchen and enjoy the tranquility of its silence. The days of that silence are numbered. Obviously, MIT is bent on pushing your kitchen screaming into the future.

But don't only consider the kitchen. Consider the workplace and the opportunities for communication between people and machines, and between machines and machines.

As the analysts from the Wall Street investment bank, Goldman, Sachs, put it seven years ago - we are in the midst of a Communicopia.

That is the word they coined to describe an intertwined landscape of data and voice communication, entertainment programming, information, news and electronic commerce.

In the interests of further full disclosure, I am proud to inform you that my son was until May a partner in Goldman, Sachs. Since the bank went public in May, he is now merely a managing director with stock from his partner's share of the business in his broker's account valued at figures that his
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> poor journalist father never dared dream about.
> A number of buzzwords have become commonplace in forecasting the future of communications.
> Among them are: Internet, Convergence and Broadband.
> In fact, rather than being a buzzword, the Internet is the honey pot arou
> which all the buzzwords...buzz.
> And yet, a communications guru of the stature of Nicholas Negroponte, the director of MIT's Media Laboratory, warns us that the Internet is what he called "wildly UNDERestimated." He says it will grow to be the enabling technology of all media - TV, radio, magazines and so on.
> Not since the telegraph joined continents in the mid-nineteenth century ha communications technology had such impact on human society as the Internet.
>
> What is convergence? It means a merger of the Internet, of telecommunications and of computers. It means putting in the hands of billions of individuals vast amount of communications power, such as I first noticed I had in my Virginia home a little more than five years ago. It also means an opportunity for single institutions or a few institutions - public and/or private (and more about that issue later) - to gain control of this concentrated power. Convergence is already showing up on TV screens and computer monitors - direct and interactive selling, auctions for millions of bidders - baubles and beads, innocent and even a lot of fun.
> But imagine a single corporate entity controlling access - at the same time, from the same source - to your telephone, wired or not, to your television receiver, to your personal computer, to your computer, data and voice network.
> Rightly so - the thought should scare the hell out of you.
> But convergence, by Internet protocol, by fiber optics, by old fashioned copper wire, is the goal
> And a means toward that goal? The other buzzword: broadband.
> The broad band is precisely that - a broad band able to provide high-speed Internet access: no dialling, no waiting, ease of reaching out to multimedia. Broadband makes it possible for the Internet to be always there. Broadband permits the Internet user to connect with cable modems at speeds between 10 and 80 times as fast as the 28,000 to 53,000 bits a second of conventional modems.
> I found no definition of broadband in the reading I've done. So I asked a Hong Kong academic for a simple definition understandable to a lay listener.
> This is what I got:
> Broadband traditionally refers to anything above a T3 or E3 link, although it is nowadays casually used to refer to anything above a 64Kbit/s circuit. In reality, the distinction between narrowband (<64Kbits/s) wideband (,45 Mbits/s) and broadband services have become blurred by technology as much as by marketing hype. Throughput is a function not just of raw bandwidth, but compression technology.
> Now you know.
>
> Three months ago, a half million families in the United States had broadband, high-speed Internet access. Research firms now forecast up to 16 million households in the United States with high-speed access by the year 2002. If it really works, bet on more than that number.
> The buzzword, broadband, has set off in the United States a
entrepreneurial, corporate struggle that has global implications.

The struggle may have its roots in the work I mentioned of those Goldman, Sachs analysts seven years ago.

Richard Simon is the media analyst and a managing director at Goldman, Sachs. He has said that seven years ago, talk of bandwidth and twisted pair compression technology simply bewildered him. So he and his group explored their way out of bewilderment. They concluded that cable - not the telephone - is the advantage communication technology to deliver information because of its broadband capability. Doing it by telephone is simply too expensive.

If this were a movie scenario, we would cut to AT&T - the American Telephone and Telegraph Co. Seven years ago, AT&T was struggling, without direction, fumbling despite its size as the leading long-distance carrier in the United States for a place in the communications and information picture. It endured a leadership horror and seemed to be slipping away.

I know because - again, in the interests of full disclosure - I've been buying AT&T shares for forty years - ever since I was that rookie editor for The Associated Press.

Now, cut to the present: AT&T under its new chief executive officer Michael Armstrong not only remains the biggest, if not the most beleaguered, long distance operator in the United States, it is -- as a result of its nearly 32 billion-dollar acquisition of Tele-Communications Incorporated -- the country's largest cable TV operator. Now, this particular shareholder wondered by AT&T was grabbing up cable companies when everybody knew other technologies - satellite transmission, video on demand direct to the subscriber, even the video cassette -- were making cable obsolete.

Back to Goldman, Sachs's Simon and his conclusion that cable is the communications carrier of the future.

Now, this drama turns into a romance. Who are two protagonists who admire each other so deeply? Goldman, Sachs and Michael Armstrong of AT&T. Goldman and AT&T long have had a warm client relationship. Did Goldman tell Armstrong about cable? Did it have to? Did Armstrong also reach the same conclusion as Goldman's Communicopia team? Who knows.

Whatever the circumstances, as Goldman and Armstrong now walk off into the cyber sunset, adoring the notion of cable as the communications avenue of the future, let's get back to the struggle.

A U.S. court has ruled that AT&T has to open its high-speed cable TV connections - at least in the West Coast city of Portland, Oregon - to all Internet service providers. AT&T says on one hand access to the Internet should be open to all, but protests that others should not use its system, on which it has spent billions. The firm is fighting the judgment. No wonder. Billions of dollars are at stake.

What AT&T envisions, as does its rivals, is being able to provide new information services, Internet access, local and long-distance fixed and cellular telephone and television services to a home or office via an all-in-one digital delivery system - payable on one bill, with discounts for using all the services of one company.

In fact, one of the major loss leaders during our coming decade is free telephone or audio messages. I mentioned that possibility before.

Listen to John Chambers, the CEO of Cisco Systems in California. He contends that as telephones, cable television and the Internet converge, providing the avenues form data, video and voice, the voice part will be free. He speaks with authority - Cisco is the world's largest maker of
Chambers said last September: The data and the video load will far exceed the voice load on the network. By 2001 or maybe 2004, he says, entrepreneurs automatically will put voice on top of the data/video network.

He says Cisco already does it. Chambers says Cisco saves 30 thousand dollars a month on calls to Japan because it puts voice on top of a data line with extra capacity without extra cost.

Now you see why AT&T - or any other long-distance carrier -- can't depend on its long-distance business.

Up to this moment, we have talked about wired technology.

Anyone who looks around today in Asia can see the future is - wireless. Look at all those cell phones. I'll be at least half the people here have them. According to the market-research firm, Dataquest, 800 million people will hold mobile phones by the year 2003. A total of 260 million, almost one third, will be in Asia.

Now, in the field of wireless technology, we have more convergence. We not only have hand-held, mobile telephones, we also are beginning to see hand-held, so-called palm-top computers. With new high-speed Internet access, you may take and make your telephone calls with your palm top. And, some day, perhaps, before the end of the decade we are discussing, you may make your computer calculations or receive faxes and Email messages with your hand-held telephone. With both, you may participate in a video conference.

Or when you travel, if you don't like the airline movie selection, you may dial or punch up your own video-on-demand subscription.

Just be careful and don't foul up the airplane's control system.

From two different directions, we are converging toward the same sort of instrument.

Don't forget the awesome prospects of dull old radio. Ultra-wide-band radio and digital pulse wireless are communications technologies of the future, providing such applications as advanced radar to help the military or searching police officers to see through walls.

Ultra-wide band radio uses digital transmission consisting of small on-off bursts of energy - very much like the technology AT&T hopes to use in sending data, voice and video through its broadband cable pipeline - at low power but almost over the entire radio spectrum.

The transmission is said to be almost impossible to jam, tend to penetrate physical obstacles and are almost invulnerable to eavesdropping.

The U.S. government is worried now the technology will interfere with civil aviation and military frequencies. But those in the field those fears eventually will be dispelled.

What the advocates of the technology see as a possibility is extremely low cost broadcast of data - as well as a more daring target: giving individuals the opportunity to broadcast in much the same way they now can send messages anywhere in the world via the Internet. That's what I call awesome.

But think data - not necessary voice or video. The transfer of information is also where the future rests.

Although two decades ago, the U.S. and other governments were providing the impetus to the new communication era we are starting to enjoy, today
developments appear to be market-driven. This development has implications for our future, too. More about that in a moment.

Right now, you don't hear much about educational uses - or even military use - of new communications systems.

Journalists have seen the value of networking via satellite in the recent bombing of Yugoslavia. The journalist of the future is now pictured with a cyber pack on his back with a global positioning satellite hookup, a small high-speed wireless modem - even eyeglasses with built-in liquid crystal displays.

In war time, the reporter better watch out. He'll look more and more like the soldier of the future.

The list of developments can go on. I'll leave you with just a couple potential buzzwords - multicasting and interoperability.

But, briefly, we should look at the social ramifications of all this future-casting. That's a buzzword I just made up.

Individuals will have more communications than they've ever had in the history of the world.

Governments, therefore, will have less control of individuals who have such capability. Their borders will become totally porous, if not totally meaningless.

Unlike governments in the past that clung to control of communications technologies through state-operated post and telegraph monopolies, The United States has set a world standard with its relatively laissez-faire posture toward the private-sector development of the new cyber economy. In the face of the increasing predominance of the private, corporate entrepreneur, what government can closely control communications in its own backyard? Is the age of conflicting ideologies ending - or will a new age rise, based on new differences to fight about. Think of the implications.

On the other hand, with communications technology so concentrated and dense, governments, corporations, groups of individuals can exercise total control in some areas with relative ease. Dare we forecast communications wars? Are the new rebels or terrorists going to be those village boys who want to chat and surf -- but do not get the power -- or the education to do so? Scary.

And what of those billions whose access to communications technology is limited by poverty and lack of education. Will they become a permanent, communications-less under-society? For example, what of the gap between Pakistan, with its skilled cyberworkers numbered in a few thousands, and India, with its skilled cyber communications population numbered in the tens if not hundreds of thousands?

Can a planet made so much smaller by the ease of communications tolerate the extremes of a skilled cyber society on one hand, and a society still mired in medievil technology, if it can be called that, on the other.

What of women, who shall compete easily with men in the brainy fields of new technology? Are countries starved for well-educated human power, going to continue to neglect their female populations as a resource?

If you've noticed, we've asked more questions than we have answered. One of the reasons I am here is to find knowledge among you, not to dispense my poor, Computer Idiot notions.

In that imbalance of questions and answers, we may find the true value of the next decade of communications advances - what it teaches us as we struggle for those answers.
Before I leave, I wish to invite you all, should you pass through Hong Kong, to visit us at The Freedom Forum Asian Center & Library in Shui On Centre, directly across from the Grant Hyatt Hotel on the main, Victoria Island.

Thank you for your attention.