CRUISIN’ THE INFORMATION SUPERHIGHWAY IN MY ’57 CHEVY: FAREWELL TO RTE. 66?

Gerard L. Ervin,
The Ohio State University

ABSTRACT

Much has been written about the "information superhighway" of late, but few of us have more than a superficial sense of what it is all about. This paper attempts to present the information superhighway — more properly, the "National Information Infrastructure" — as a graspable whole, beginning with its improved human factors (ease of use, or ergonomics), increases in the extent of its offerings and number of users, and its advancing technology that is growing ever faster, better, and cheaper. The information superhighway is described as having four principal functions: information, communication, services, and entertainment. Finally, this paper suggests some of the challenges that the information superhighway presents to the foreign language teaching profession.

INTRODUCTION

Is there anyone left in America who has not heard of the information superhighway? Lately the metaphor, which Vice President Al Gore is said to have invented in the late ’70s, has seen particularly heavy use in the media. One news story reported that in January, 1993 the term "information superhighway" appeared just 57 times in articles on the Nexis database of the public media; but in January of 1994 a search of the same database found the term 1,480 times.¹ Many of us feel we cannot keep up with the development of technology in general, nor with the information superhighway in particular — it’s all happening too fast. Not only is it moving with blinding speed; as it’s
taking shape, it's changing in fundamental ways. It's like the biblical parable about building a house on rock vs. building a house on sand, only it's worse: not just the technological bedrock beneath us, but even the ergonomic landscape around us is shifting and changing.

The whole climate of connecting, computing, and communicating is changing. The cutting-edge, gee-whiz stuff of five years ago, like integrated text, sound, and color graphics delivered via a desktop computer is now tame. Researchers at Indiana University even envision virtual textbooks," clipboard-sized computers with built-in lessons, review drills, and data banks of reference materials. They're also talking about full-motion interactivity in a virtual reality environment, so that students studying the passage of blood through the body, for example, will be able to swim along with it.2

PROLIFERATION AND INTEGRATION

Let's start with the question, “What is the information superhighway?” Humor columnist Dave Barry suggests that by the end of the 1990s people will have realized the information superhighway is essentially CB radio, but with more typing.3 In a sense, Barry is right; the information superhighway is conceptually fairly simple. But it's far more than the Internet and electronic mail, which is what I suspect most of us think of first; and it's far more than expanded cable TV, which many of us have been hearing about. It is, in fact, the sum total of all the electronic conduits leading into and out of our homes, schools, businesses, and indeed all of total global society, seamlessly linked together. For all the technological wizardry that we have seen and are going to be seeing, the real key to the information superhighway is, I submit to you, that little phrase, “seamlessly linked together.”

Let me illustrate: Once upon a time your telephone was your telephone, your TV was your TV, and your stereo set was your stereo set. When your computer came along it, too, was a separate entity. But the hardware lines started to blur when you got a VCR, and then hooked your TV up to cable. Now you had three input sources — broadcast, cable, and videotape — giving you tens of choices at the flick of a switch and thousands of choices if you were willing to run over to your nearby video store. Of course, it was still just a TV — or was it? When you got your kids a Nintendo set, they started to interact with your TV. That was a quantum leap for the TV set.
Or consider the Home Shopping Network, which I imagine all of us have seen at least briefly. It has blurred even further the lines between incoming and outgoing signals, between receiving entertainment and information from the TV on the one hand, and accessing services via it on the other. Of course, for the time being you still need your phone — but that won't last.

Let's now consider the other electronic devices in your house. You have a telephone; maybe you have an answering machine. Maybe you have a phone with a built-in answering machine, and you probably have a modem for your computer. Maybe it's even a fax modem. And maybe some of you now have combination fax/modem/answering machines all residing on a chip in your computer. This is more than just hardware proliferation — it's hardware integration.

If you've hooked up a CD-ROM to your computer — I don't have one yet, but we all will, eventually — it allows you to bypass your stereo set for music, stop thumbing through the encyclopedia, dictionary, and thesaurus for your writing, and give away the Monopoly set and video games you'd been using for entertainment. Sitting in front of a computer screen, we can now write, budget, play games, send or receive a fax or e-mail, listen to music, watch a video, look up something in an encyclopedia — the list is, literally, endless.

Some of us may still have a rotary-dial phone somewhere and a black-and-white TV set. And most of us still like to read a book — a real, paper, book. But inexorably (and most decidedly not slowly), everything is becoming linked and our electronic options are growing. That is the information superhighway in a nutshell: hardware, software, and connectivity — proliferation and integration.

**EASIER, MORE, BETTER, FASTER, CHEAPER**

The explanation behind the dazzling speed at which the information superhighway is growing can be summarized in five words: easier, more, better, faster, and cheaper.

In the first place, it's all getting easier. That's ergonomics, human factors, the theme of this conference. Concern for ergonomics in computers has been increasing tremendously. As long as engineers were designing computers for other engineers and techies to use, ergonomics took a back seat. At the dawn of the computer age in the
1950s a real programmer — the only ones admitted to the priesthood — wrote in the octal and hexadecimal Greek of machine codes. This was the only way to interact with a computer, and no one expected it to be easy.

In the ’60s some folks started to write in compiler languages, like FORTRAN and COBOL. These programmers were initially dismissed by the old guard as unsophisticated, but they prevailed — in no small measure because these new ways of delivering instructions to a computer made the newer breed of programmers vastly more productive than the old guard could be.

Each new stage has taken more of the mystery out of the mastery of computers. One can still write programs in hexadecimal code if one wants to, but one no longer has to. And with voice recognition technology (already being employed on a limited commercial basis by some of the long-distance telephone companies) we will even be able to bypass the mouse and the icons.

As use of the technology on the information superhighway use gets easier, it grows (the ‘more” of my five-word summary). It gets more users: critical mass is being reached. Electronic communication is now no longer reserved for geeks and nerds. It’s hooked up bankers, brokers, and bureaucrats of every stripe. The commercial services are making electronic access available to everybody for less than one’s local phone bill. And as we get more users, we get even more information and more services available electronically. For example, one can now get the federal budget on CD-ROM or download it; and next fall we’ll be able to access the entire 44-million word Encyclopedia Britannica via the Internet.

With “easier” and “more” comes “better.” The "better" I’m talking about has to do with digital technology. Most of us are familiar with digital technology’s impressive improvements in our stereo systems, for example. But it goes far beyond that. For example, it wasn’t even three years ago that we were reading about high-definition television, HDTV. It was going to render all present television sets obsolete. But what has happened in the past six months? Digital HDTV has been developed in the United States. It’s supposed to be so superior to the European and Japanese analog HDTV technology that it will become the international HDTV standard.
Digital technology means not only means "better" — it also means "faster." Faster in terms of the speed of processing. Faster in terms of transmission. Digital technology allows accurate data compression and manipulation as well as the use of fiber optics; and fiber optics means both higher capacity and faster transmission rates than have been possible via conventional wires or even coaxial cables (although impressive advances are being made in those areas, as well).

Finally, things are getting cheaper. The principle is simple: in any industry, greater demand allows economies of scale, and given any competition at all, these economies eventually reach the consumer. We've all seen this happen with hardware and, more recently, with software. Now it's happening with services as well: the commercial electronic service providers are tripping all over one another to cut their costs and sign up subscribers. It's even more obvious elsewhere. Ten years ago AT&T handled 37.5 million calls per average workday, with 44,000 operators; today it handles 150 million calls per day with 16,000 operators. The difference? Computers, competition, and automation.8

Put it all together and what do we have on the information superhighway? It's getting easier to access, its offerings are becoming more and more extensive, the technology behind it is getting better and faster, and it's becoming so cheap that virtually everyone will be able to afford to use it, to one degree or another. That, I submit to you, is a sure-fire formula for success. It's a snowball that started, one could say, with the Apple II and the Radio Shack TRS-80 in the late 1970s, and has now turned into an avalanche.

It can be hard to grasp how fast this avalanche is moving. Let me draw an analogy to geologic time scales. They are so vast, they must be compressed to be grasped. We've all heard those illustrations. For example, if all 4.5 billion years of geologic time to the present day were compressed into the 24 hours preceding this moment - that is, the Big Bang occurred yesterday morning at this time — then dinosaurs appeared, flourished, and died off about an hour and a half ago. And the 4.5 million years of human history? Nothing to it: on our compressed geologic time scale, all that separates us, here, this moment, from the Leakey's Lucy and her hunting-gathering clan shuffling around in Africa is less than 90 seconds.
By contrast, the electronic time scale must be expanded to be grasped. For example, at Ohio State University we just bought a new Cray T3D supercomputer. It will do 6.3 billion computations per second. How fast is that? If each computation took only one second, 6.3 billion of them would take over 200 years. And this, by the way, is a bottom-of-the-line Cray; they have models 30 times more powerful than the T3D.

INFORMATION, COMMUNICATION, SERVICES, ENTERTAINMENT

If we now have a sense of what the information superhighway is and what’s behind it, let’s turn to the question of what’s on it, what it’s doing. I suggest we treat this under four headings: information, communication, services, and entertainment.

Information

I’ll start with information. To distinguish information from communication, I suggest that we have "information" designate principally one-way transfer, from some electronic source (a library, a database, or whatever) to the user. For example, I used the informational resources of CompuServe when preparing this presentation: I set up an Executive News Search that scanned the wire services’ stories for the phrase “information superhighway” for a period of about three months. I also did a retroactive on-line search of a media database, pulling up archived news and feature stories on the information superhighway from the past year. (Anything before that is, on the electronic time scale, antediluvian.)

As a result of that experience I can tell you firsthand that one can easily get overwhelmed with information via the information superhighway. For example, from my searches I selected this or that story for later perusal and casually dumped my selections into a file on my hard disk. My selection rate may have been 50% no more. But when I finally printed the downloaded articles out to take with me on a plane, I had over 200 pages of material. Many members of newsgroups or mailing lists on the Internet have had similar experiences: I’ve actually removed myself from several mailing lists (also known as “listserves”), interested in them though I am, because I don’t have the time to keep up with them.
Communication

The second of the four aspects of the information superhighway is, as I see it, communication. This is where I put e-mail. In a sense, of course, e-mail, mailing lists, and newsgroups bridge the gap between the information and communication functions of the information super-highway. In talking about communication, I’ll start with the private networks (such as CompuServe, Prodigy, GEnie, America OnLine) because for the time being, at least, it’s easier to get a handle on them. The private networks have, collectively, some 5 million subscribers; and Apple Computer, Inc., has just announced plans to enter the field, crowded though it may already seem, with its e-World service. Apple sees the potential for $20 billion in revenues by 1997. Computer analyst Andrew Seybold has said that “1994 is going to be the year of the network infrastructure war.... Companies are realizing quickly that the hardware side of this business is not where the money is — the money is in services.”

Of the private networks, the one I know best is CompuServe. Presently it has 1,700 databases and 1.7 million subscribers, and its subscriber base is growing at 60,000 a month. On the Foreign Language Forum — the little corner of CompuServe that I am involved in — over the past five years we have experienced over 30% growth per year in on-line time. CompuServe is not alone, and may not even be first in the Grand Prix of cybergrowth. You may have read that America OnLine has experienced such tremendous expansion over the past six months that it actually outgrew itself and had to severely limit access last month while it upgraded its phone lines and file servers. And these are services that people pay for, up front, just as one pays for one’s telephone and daily newspaper. Imagine what the growth would be like if it were all free.

That brings us to the Internet, which, for most end-users at most academic institutions, is free. The Internet is so big it defies description. There are an estimated 20 million individual users of the Internet worldwide. It seems every week another college, university, library, research lab, or whatever is going on-line with the Internet, opening up vast amounts of computing power to anyone, anywhere in the world, who has the right kind of account. Moreover, when an institution goes on-line it adds anywhere from dozens to hundreds to thousands of individuals to the network, as well.
No reliable data exist on how many of America’s 3,300 colleges and universities are connected to the Internet. The National Science Foundation has identified 1,100 Internet addresses as belonging to US colleges and universities, but the total number of institutions is probably higher than that, since many larger institutions extend access to smaller institutions in their area. One guess is that 7 out of 10 are connected to either Internet or Bitnet. What’s causing all this growth? Among other things, ergonomics. The Internet is swiftly coming out of the nerd era, as graphical interfaces (point-and-click icons) replace complex commands via freeware and shareware programs like Gopher and the next generation, Mosaic. And not surprisingly, the easier the Internet becomes to use, the more use it gets.

The communicative power of just the Internet and the commercial networks (they can now all talk to each other) is stupefying. And it’s dangerous. A single message can be sent to a thousand people, or ten thousand, as easily as to one person. If that message happens to contain inaccurate information — whether intentionally or innocently — the damage is still done once the ‘enter’ key has been pushed. And the continued development of the Internet is going to dwarf what we have today.

Services

The third aspect I see of the information superhighway is that it links us up to services, both commercial and noncommercial. The Home Shopping Network is just the tip of the iceberg, and though it’s not very impressive, its popularity is telling. It has limitations: it requires you to use your telephone, and it’s linear - the viewer who’s after a snazzy cubic zirconium pendant is at the mercy of the order and rate at which items for purchase are presented by the producers. But with the full advent of the information superhighway, this won’t be the case. Prognosticators have envisioned new-car buyers sitting at home, for example, talking to salespersons over interactive video links about options, colors, and fabrics for their new cars. The salesperson might even be bypassed: with a mouse click shoppers themselves will be able to compare the naugahyde interior to the plush velour, or the “sea foam” paint job to the “summer dawn” version. And it could (and probably will be) that way with virtually anything we want to buy.
The noncommercial services are expanding, too, though perhaps not as fast. TV classrooms, for example, are thirty years old, going back to the black-and-white chemistry lectures of my own undergraduate schooling. But since then things have gotten more sophisticated: I expect we all know of languages from Spanish to Japanese to Russian being taught by 2-way interactive color TV, bringing the benefits of that instruction to small numbers of students at tiny schools in the hinterlands of the midwest that could never, otherwise, consider such offerings.

Outside the foreign language sphere, there are other examples: not long ago I saw a TV special about rural hospitals in Texas that were “transporting” patients electronically to specialists in large, urban hospitals. Rather than physically hauling the patient to Dallas, say, or having the specialist spend valuable time driving from Dallas to the small hospital where the patient is, a video cart is wheeled to the patient’s bedside at an appointed time. Via a live interactive audio and video hookup to the physician’s office hundreds (and of course it could be thousands) of miles away, the specialist can do everything but touch the patient. The specialist can even be fed signals from on-the-spot diagnostic instruments (an EKG, say). The results? Improved medical care at reduced cost. I think that the service sector of the information superhighway is just beginning to be exploited.

Entertainment

Significant though they are, the information, communication, and services aspects of the information superhighway are being dwarfed by the power, size, and scope of the entertainment industry. If you have any doubt about this, I refer you to the cover story in the March 14 issue of Business Week, “The Entertainment Economy.” In it, Lee Iacocca compares the entertainment boom to the Sutter’s Creek gold rush. Another executive quoted in the story says that “The entertainment industry is now the driving force for new technology, as defense used to be.” A story on the information superhighway in Popular Mechanics last January lamented that the information superhighway may seem to some to be no more than “cable TV on steroids.” At 500 channels — the figure I’ve heard bandied about — it could certainly appear that the entertainment function of the information superhighway will, in economic terms, eclipse everything else.
As educators we could lament this. Do we really need Beavis and Butthead in virtual reality, you might ask? It could, truly, come to what Ray Bradbury envisioned forty years ago in *Fahrenheit 451*: people sitting at home participating in interactive soap operas on a wall-sized TV screen. But since the entry of the entertainment industry upon the information superhighway is inevitable, let’s look at it from another perspective: let’s consider what it can do for us if we’re smart enough to exploit it.

The dollar potential of the entertainment and commercial services’ use of the information superhighway will ensure its coming into being in virtually every home and office in America, and eventually around the world. What does this mean to us? Just this: the information superhighway is all about integration and connectivity. Its growth and true utility will only become realized as virtually everyone, everywhere, is hooked up. So, while we might like to see some other impetus for the onrushing growth, expansion, and popularity of the information superhighway, we must accept that its arrival is being hastened by the massive amounts of money to be made via its entertainment mode. And us? We in education are entering an “Era of the Tremendous.” Let me explain:

THE "ERA OF THE TREMENDOUS"

First, there will be tremendous demand for our services. The information and entertainment functions of the information superhighway are facing a huge vacuum: something needs to be carried by all that electronic connectivity. That’s what the frenzied bidding war in January over who was going to finally buy Paramount Communications was all about — the bidding companies wanted to acquire Paramount’s film libraries.

The demand for our services will come from another direction, as well: in addition to the youth market for education that we’ve always had, the American population is aging and people are retiring earlier and earlier. The first baby boomers will turn 50 in two years. The result is going to be a tremendous increase in the number of people with leisure time, and they will be looking for something to do. What will fill that void? Education can, and will probably be expected to. In a recent episode of "Northern Exposure," Ruth Ann, the senior-citizen proprietor of the general store, had begun studying Italian via a cassette course; she’d always wanted to read *The Divine Comedy* in
the original. That's what retirees often fill their time with: the arts and the humanities, specifically languages. (Relatively few of them, I surmise, will take up molecular genetics.) Thus, the information superhighway is going to be the vehicle by which we, as foreign language educators, can reach out, touch, and enhance the lives not only of our traditional clientele, but also of this new and growing group of customers. Actually, it's already happening.

Second, there is going to be a tremendous new outlet for our imagination. Recently John Lombardi, president of the University of Florida, suggested that education should not wait for snazzy graphics and programming to stake its claim on a portion of the information superhighway. He suggested that we take what we already have — lectures and classrooms — and make them available to all takers via increasingly inexpensive television distribution. Though I certainly second Lombardi’s call for education to stake out a claim in the information superhighway, I have the feeling that his suggestion — that we offer what we already have, i.e., put lecturers in front of TV cameras — could cause us to lose the battle before it’s joined. Educational programming has too long been dull and unimaginative. It’s an image we must shed.

It's time for us to go for quality, not quantity and release more programming like French in Action and Destinos (they’re tremendously popular whenever they are broadcast in a local area), and make SCOLA downlinks more generally available. To deserve a place and win a following on the information superhighway, education needs professional production values, like those the boomer generation learned to expect via “Sesame Street” and other quality children’s educational programming. To put it another way, just as no one buys a Porsche to tow a trailer, the information superhighway is no place for the talking heads of yesterday’s TV classrooms. At least, not as the main course. Educators are, or at least should be, among the most creative, innovative people in the world. Our business puts us in daily contact with the youngest, brightest, and most inquisitive minds on the planet. We’d better accept that challenge.

In that connection, let me pose this question: Why is it that we refer to the electronics "industry," the pharmaceutical "industry," and the entertainment “industry,” but we say the educational “establishment”? Doesn’t “establishment” suggest a stodginess, a predisposition to accept and modify the status quo rather than to strike out in new and untried directions? I suggest to you that in an ‘industry," such as the advertising or
automotive industries, innovation is prized and, indeed, is essential for survival. Sure there are blind alleys; and it costs money to explore those alleys. That's a recognized cost of doing business. Perhaps education should be no different. Let's become an education “industry,” willing to experiment in uncharted waters.

If we do this, it's going to cost money. Who'll pay for it? I don't think we can or should keep looking to the federal government to do this job. The feds are so massively overcommitted that they cannot balance even one year's budget, let alone address the crushing federal debt. The $4.5 trillion — that's TRILLION — dollar national debt (which works out to $17,000 for every American) is growing at $13,000 per second. (That means that in the last hour that you've been sitting here, the national debt has gone up $47 million.) The feds cannot bankroll what we need.

Who's left? We may not immediately like this suggestion, but I don't see any alternative: I think the education industry is going to have to take a hard look at itself and at where the production expertise and the money are and team up with the entertainment industry. While we cannot expect an industry that has learned to make billions every year by pandering to the tastes of the lowest common denominator to suddenly become wholly altruistic and socially responsible, there are encouraging signs among some enlightened companies. Some were featured in that Business Week entertainment article I mentioned earlier.

Finally, the information superhighway is posing tremendous challenges to our profession. These are challenges regarding what we deliver and how we deliver it. You may remember the film "Dead Poets Society," which taught America the phrase carpe diem, “seize the day.” I suggest that for the education industry the watchword must become “harness the medium.” The TV screen, for example, is no longer a limited-choice menu; it is now a huge, all-U-can-eat buffet. For the mental health of our country, we cannot allow this cybernetic salad bar to be dominated by the often enjoyable but high-fat, low-nutrition desserts so lamentably typical of the entertainment industry. I believe that the long-term potential of mind pollution delivered by irresponsible elements within the entertainment industry is every bit as hazardous to our nation's and the world's future as is the long-term potential of environmental pollution and poor health practices. We must find some common ground to work together to improve the mental diet. At the risk of sounding overly dramatic, I believe that education is the key
to the future of the world, and that within this room sit the people who can shape the
foreign language profession’s response to the particular challenges and opportunities
presented to us by the information superhighway. Educators and parents must form
new alliances to work with responsible private enterprise to foster among young people
the values that will help them make informed and sensible choices about life and
leisure. And it can begin with us.

It may be time for an organization like CALICO to propose a cross-disciplinary task
force — not unlike the current cooperative standards task force comprised of ACTFL,
AATF, AATG and AATSP — to unite ACTFL, NCTM, NCSS, NCTE, MENC and similar
organizations in an effort to focus specifically on meeting the challenges and exploiting
the opportunities presented to us by the information superhighway.

Just as Route 66 and the ’57 Chevy represented the opening up of a whole country to
my generation of high school and college kids, the information superhighway opens up
a whole world to the present youthful generation. But they’re not yet in a position to
take charge of the information superhighway — it’s our job, for it’s taking shape now.
Can we in the education industry be flexible and nimble enough to react creatively and
responsibly to this challenge, this opportunity? I think so. And I think that
organizations like CALICO and the members within it can be key players on the team
of designers and builders of the information superhighway. Go get ’em, CALICO!

NOTES AND REFERENCES


2 See, for example, Peter Monaghan, "Sensoriums" and "Virtual Textbooks," Chronicle of Higher


4 Jerry Martin, Internet specialist with the Ohio State University Academic Computing Services
pointed this out most succinctly.


7 “The Call to Arms: Phone Companies Fight Competitors in the Digital Age,” US News & World

8 Columbus Dispatch, February 27, 1994.

9 Columbus Dispatch, December 23, 1993.

As a way of getting a handle on $20 billion, consider that the entire budget of Ohio State University, one of the two or three largest universities in the country, is $1.3 billion; so the revenues envisioned from one year of operation of the electronic networks could keep Ohio State afloat for some 15 years.


Knight-Ridder to the Columbus Dispatch, January 4, 1994.

Columbus Dispatch, March 7, 1994.


I am indebted to Prof. Steve Acker of the Ohio State University Department of Communications for first suggesting this notion.


AUTHOR'S BIODATA

Gerard L. Ervin is Associate Professor of Slavic and East European Languages and Literatures at The Ohio State University, where he teaches Russian language and methodology. He founded the OSU Foreign Language Center, is past president of ACTFL, and in 1985 co-founded the Foreign Language Forum on CompuServe.

AUTHOR'S ADDRESS

Slavic Department, 232 Cunz Hall
Ohio State University
Columbus, OH 43210
Fax: (614) 451-6924
E-mail: 76703.2063@compuserve.com