

Commercializing the Information Superhighway: Are We in for a Smooth Ride?

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March 1994

This paper appears in print as: Hoffman, D.L. & Novak, T.P, (1994), "Commercializing the Information Super Highway: Are We In for a Smooth Ride?" *The Owen Manager*, 15(2), 2-7.

1. What is the Internet?

Almost daily, articles about the Internet and the Information Superhighway appear in major U.S. newspapers, such as the [New York Times](#) and The Wall Street Journal. At the end of last year, NBC Nightly News broadcast a five part series on the Information Superhighway titled "[Almost 2001.](#)" After the first show, NBC received over 1500 electronic mail messages from all over the world in response to the broadcast of their Internet address (nightly@nbc.com). Increasingly, you cannot pick up a newspaper or listen to the television news without reading or hearing about the Internet and the Information Superhighway. What is the Internet, and why is it generating so much excitement in the business world?

The Internet is the world's largest computer internetwork. It grew out of the US Department of Defense-funded [ARPANET](#), which was restructured in the early 1980s to connect several hundred university, national laboratory, and government mainframe computers (host computers) for the exchange of email, data, and computing resources. At that time, the [National Science Foundation](#) (NSF) built the high-speed long-distance data lines that form the Internet's backbone, with costs shared in a co-op arrangement among its primary users. In that sense, no one entity actually owns or singly controls the Internet, although today nearly 20,000 different organizations worldwide from large corporations to the military to the government contribute toward its costs.

ARPANET originally grew out of a Department of Defense need in the mid-1960's to provide the Pentagon with a military and command control communications system that would operate even if the US was ravaged by a nuclear attack. Paul Baran of the Rand Corporation developed an ingenious solution: a computer communications network with no hub, no central switching station, no governing authority, and the fundamental assumption that links between any two points (cities) were completely unreliable. In his design, communications were cut into strips and put into electronic envelopes called "packets," each addressed to the receiver and indicating the sender. The individual message packets were routed their own ways, only to be reassembled at destination. If they got lost or damaged, they were simply sent again.

By the late 60's and early 70's this "packet-switching" network showed up in university and government research labs and eventually became the technological underpinnings of the Internet. Thus, the Internet, until just a few years ago, was comprised of a few thousand computer nerds and techies. Its recent explosive growth, particularly in the commercial domain, is due to the NSF's 1991 lifting of restrictions against commercial use of the Internet, and more recently to [Vice President Al Gore's](#) plans announced in 1993 to make the Internet the starting point for the "[National Information Infrastructure.](#)"

How Big is It? The Internet is estimated to have 15-20 million users, directly connected via more than 2 million computers, and is growing at the rate of 1 million new users a month. It has doubled in size every year since 1986, extends to more than 50 countries and is projected to have more than 500 million users spanning 100 countries by the end of this century. Growth in the US is now slowing down to about 80% a year, but in the UK, for example, the number of hosts increased 200% in 1992 and 170% in Japan.

Over 10,000 networks passed traffic through NSFNet in 1993, which is more than twice the number of networks that in 1991.

With numbers like that, the Internet has reached critical mass. Businesses are increasingly taking a serious look at doing business on the "Net," as they begin to realize its potential as both impressive business opportunity and tool to improve productivity. Commercial computer networks are now the fastest growing segment of the Internet, increasing more than sixfold since 1991. The Internet is fast, inexpensive, international, encourages collaboration and resource sharing, and has tremendous, often overwhelming, amounts of information.

The Information Superhighway. The tremendous growth of the Internet and a desire by Congress and many in industry to build a high-speed national data network, the so-called *Information Superhighway*, has led to a search for a way to commercialize the Internet. This is because many view the Internet as the front-runner or prototype for the national network.

The Vice President has suggested two guiding principles for open competition that the Administration intends to encourage as the network is developed:

1. "Universal Service" - "an affordable opportunity for every home to plug into the multiple information sources available in the future," and
2. "Open Access" - "providers of information and entertainment will have the right to offer their services over network distribution systems at fair, competitive prices. The cable or phone companies, in other words, could not control other companies' access to the networks through discriminatory pricing."

As the regulatory landscape begins to take new shape over these issues, we're witnessing a massive land rush as everyone - commercial enterprises, new users, students, executives, politicians and small businesses - clamors to make a stake in the new frontier.

What Can You Do On It? The Internet has over 5000 special interest discussion groups ("**Usenet News Groups**"), 2500 mailing lists (newsletters) and thousands of **ftp** and **telnet** sites around the world for resource sharing (data transfer and remote log-in). As might be expected, electronic mail (email) and other communication and information services are among the most popular applications. For example, on the Internet you can:

- Send mail, find a recipe for a favorite dish, see what's happened on the latest episode of **Star Trek**, discuss religion, eighth grade education, particle physics, and current affairs.
- Check your **local weather**, the weather elsewhere in the world, view current **satellite weather photos**, or watch a movie of a current hurricane.
- Visit **Australia**, **Penang**, or Kuwait online using **Global Network Navigator**, an information center produced by **O'Reilly & Associates, Inc.**
- Talk to people from all over the world, in real time, at *any* time of the day or night, on virtually any topic you choose (a great opportunity to brush up on your French or Russian).
- Download and listen to hour-long radio programs on "**Internet Talk Radio**," which feature in-depth interviews and can be described as the "NPR of the Internet."
- Subscribe to a mailing list just for MBAs, parents of elementary-school aged children, or people with a rare form of Leukemia.
- Buy CDs, books and numerous other goods and services, find out about the latest gossip on Madonna from **MTV's** computer, or download and play audio files of the latest songs from MTV's archives.
- Download free software, a scientific research paper, read the newspaper, read your mail.
- Log in to a colleague's computer in Australia.
- Read full-text copies (including photographs) of magazines such as **Wired** and **Mother Jones**.
- Spend an evening *net surfing*, aka cruising the Internet where you explore the Net in search of information, visiting places you've found before, finding new places, communicating with people, getting things, and generally having a good time in cyberspace.

In order to do all of these things, you need access to a computer which is directly connected to the Internet, and a computer program which lets you take advantage of the Internet's vast resources. The program of choice is "**Mosaic**," developed by the **National Center for Supercomputing Applications**, at the **University of Illinois**. Mosaic has been described as the Internet's first "killer application," - that is, a program so irresistible and compelling that people will sign up for Internet access just to be able to use it. With Mosaic, you can access the full range of text, video, and audio resources of the Internet using a graphical mouse-based "point and click" interface. However, it requires fairly sophisticated communications access to the Internet. With a standard dial-up connection, you can still access the vast majority of the Internet's resources with simpler programs.

2. Where is the Information Superhighway Headed?

Research in marketing has identified three broad categories of new product innovation, based upon the extent to which the innovation 1) represents a technological advance and 2) requires changes in consumer behavior. We present three alternative scenarios of the Information Superhighway which correspond roughly to these three types of innovation. We examine the implications of each for the relationship between the customer and the service provider. The broader marketing implications depend on a thorough understanding of these issues. Below, we use service provider to mean a firm or organization providing either an information/entertainment service over the Internet, or else using the Internet as an avenue to market a tangible product (compact disks, clothes, books, etc.)

Scenario One: "Couch Potato Heaven". Unless you have been living under a rock, you have more than likely heard the visions of, for example, interactive television, 500 channels, and video on demand. *Interactive multimedia*, that dynamic merger of video, audio and computer technology, could enable the Information Superhighway to deliver a dazzling array of entertainment and educational alternatives onto screens in American homes.

While far beyond current capabilities of cable television, this scenario of the Information Superhighway represents a relatively modest degree of innovation. This limited view of the Information Superhighway presents the consumer with *more* options, but it is virtually identical in spirit to existing services, such as movies on-demand offered by many hotels, or Phillips' interactive CD. While the customer in "Couch Potato Heaven" can interact with the television by requesting movies and information, she is still in a relatively passive position, and the information provider dominates the interactive relationship.

Scenario Two: "The Electronic Shopping Mall". In this dynamic extension of the first scenario, a concentrated number of providers will take over the Information Superhighway and render it a giant electronic mega-mall. This means, for starters, that the customer must pay an entry fee to gain access to the "mall," even to "window shop" (think of Prodigy or other commercial on-line services). Further, if what the customer wants is not in the mall, she can't get it, at least not without going to another mall (with its own entry fee).

The Electronic Shopping Mall vision would place the customer in a more active role than would Couch Potato Heaven, although the channels of communication would still be primarily between centralized service providers to individual customers. The customer would still be thrust into a largely dependent role with information controlled by the set of service providers. Customer feedback would be sought by the service providers, but the service providers would still retain the upper hand in the balance of power.

Scenario Three: "Free-Market Internet". In the third scenario, thousands of individual entrepreneurs ("mom and pop shops"), small businesses, and large communications empires set up shop on the Information Superhighway in a free-market version of the Internet. While there would probably be a "toll charge" to tour the highway, the customer could freely visit available service providers, paying only for services actually rendered. Quite likely, there would be a number of free public access services, as well (cf. the Interstate rest stop with free maps, directions, and coffee).

This scenario retains both the wide-open spirit and broad scope of the Internet. Distinctions between "customers" and "service providers" would blur, because given fairly modest resources, *any customer* could become a service provider. It also places customers and service providers on nearly equal footing. In this view, communication would no longer be characterized by a "hub-and-spoke" pattern, from centralized service providers to individual customers. Rather, as in the current Internet, the communication pattern would follow a "World Wide Web" of linkages between millions of sometimes interchangeable customers and service providers. The Information Superhighway would serve as a true network for communication between and within customers and service providers.

Which Scenario Should Dominate? A concern we hear frequently about the Information Superhighway is that people will stop interacting with each other, and only interact with computers. This is much more likely under the first two passive scenarios. These mass market scenarios are held in particular disdain by many Net veterans, owing perhaps to the lowest-common denominator orientation (cf. cable and broadcast television) intrinsic to them.

However, in the third scenario, where the Information Superhighway is developed in keeping with the original spirit of the Net, people are likely to interact *more*, not less. The fact that email and personal communications are among the most popular categories of traffic on the Internet suggests that large numbers of people want and need to talk to each other and do not want to become passive information and entertainment receptacles in their homes.

Some marketers suggest that potential customers will want to operate new media technology with a simple remote control device, rather than, for example, a computer keyboard. However, without the capability of *active input* from the customer, for example in the form of typed sentences or verbal commands, interactivity will be reduced, leading to the two passive scenarios. We believe this passive view underestimates many customers' desires to be active participants on the Information Superhighway.

For instance, using a computer program like Mosaic to "net surf" radically demonstrates how different the Internet is from the passive interactive multimedia vision of 500 channels on your TV set operated by remote control. Freed from the boundaries of space and time, you can hop from computer to computer, seeking information and exploring new ideas. The experience is social,

full of information and driven by curiosity. And the Internet already offers more than 10,000 actively interactive channels. The millions of current Internet users are unlikely to be satisfied with a vision of the Information Superhighway that is anything less than what already exists.

3. Are We in for a Smooth Ride?

While waiting the arrival of the Information Superhighway, service providers are prospecting the Internet for business opportunities. However, its culture stands as a barrier to commercialization. The Internet does not lend itself naturally to free-market enterprise. Developed from a vastly different culture -- no one "owns" the Internet -- it is a no-holds barred, speak your mind, censor-free and open environment. The hallmark of the Internet is the free exchange of ideas among both like-minded and opposing parties. Long-time users of the Internet express anxiety over what might happen as commercial interests become increasingly developed: will they be pushed aside? Will they lose their access? Will it become too costly for them to use the Net?

Besides the culture of the Internet, marketers face a number of other hurdles that must be overcome if the Internet is to become the backbone of a commercially viable Information Superhighway. These include:

- **Security.** The Internet is currently not sufficiently secure to transmit sensitive information, e.g. credit card information for customer orders. Relatedly, what sort of legal tender should the Internet use? Should we use credit cards or some sort of "digital cash"?
- **Privacy.** Direct netmail, to cite one specific example, is considered an invasion of privacy deserving of punishment - offenders get "flamed" with torrents of venomous email. This can obviously hamper your marketing efforts.
- **Pricing.** The issue is both subtle and complex. Current commercial online services use a pay-as-you-go pricing system and/or are based on flat usage fees. The Internet is strictly flat-fee and unbelievably inexpensive. Once you are connected, there are no additional fees besides the connection fee. This aspect of Internet culture will be enormously difficult to overcome; on-line services ignore this at their peril. An ironic implication is that as commercial services add Internet gateways for their customers, making the Internet even more attractive to people, it is the case that Internet users pay nothing to reach, for example, Prodigy customers via email, while some of those commercial subscribers must pay to reply or to reach each other. Relatedly, much of what the large communications companies plan to offer in the way of interactive multimedia technology the Internet already offers "for free."
- **Global Marketing.** The Internet requires "acting locally but thinking globally," as it truly international in scope and crosses cultural and language boundaries. We can only imagine the tremendously difficult and complex issues - legal, political, and ethical - that will arise as we attempt to market services and information globally.
- **Advertising.** The Internet will likely require a completely different advertising effectiveness model. No one yet seems to have a firm handle on what kind of media environment this represents for marketers. What we do know is that the Net is active, while traditional broadcast and cable media are inherently passive.
- **Measuring Demand.** Marketers are not very good at measuring demand for truly new products and services. How to do this for the new Information Superhighway, whatever its form, is the billion dollar question as we approach the new millennium.

While the Internet has tremendous potential for business, all is not boundless opportunity and easy profits. There have been some notable failures with commercial online services. For example, **IBM** and Sears have lost \$500 million to date on Prodigy; Warner Cable's interactive QUBE project lost \$20 million between 1977 and 1986, until the project was shelved; and PC home banking has for the most part been unsuccessful.

This suggests that there will be pitfalls to developing interactive multimedia products and services on the Information Superhighway. A large mass market, deep pockets, and previous mass-media experience alone will not guarantee success. Understanding what customers want, are willing to pay for, and what satisfies them remain deeply misunderstood or understood too little by many marketers.

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