

The Internet and the Information Infrastructure: What Is the Difference?

By Pekka Tarjanne

The Internet in Real Time

The next big development we can expect to see on the Internet is the promotion of real-time services as opposed to the standard store-and-forward services that currently dominate. Do not get this wrong: store-and-forward services — such as e-mail, bulletin boards, online databases, or text retrieval — will continue to be the mainstay of the Internet for many years to come. But the bigger market opportunity lies in real-time services.

At the moment, it is possible to receive near-real-time services; for instance, you can watch a video clip of President Nelson Mandela's speech at the opening ceremony of TELECOM 95 on ITU's home page on the World Wide Web, or, with some technical expertise and a lot of patience, you can make Internet telephone calls with a speak-and-listen delay of a few seconds. The current status of these types of applications is enough to satisfy the engineer but not the consumer. There are enormous problems — of service quality, of ease of use, of bandwidth — but the point is that these problems are ultimately solvable. So think not of where these services are today, but where they will be in five years' time.

The development of real-time services delivered over the Internet represents a threat to established communication service providers. This is mainly because of the pricing mechanism that is being used. Access to the Internet is, for most

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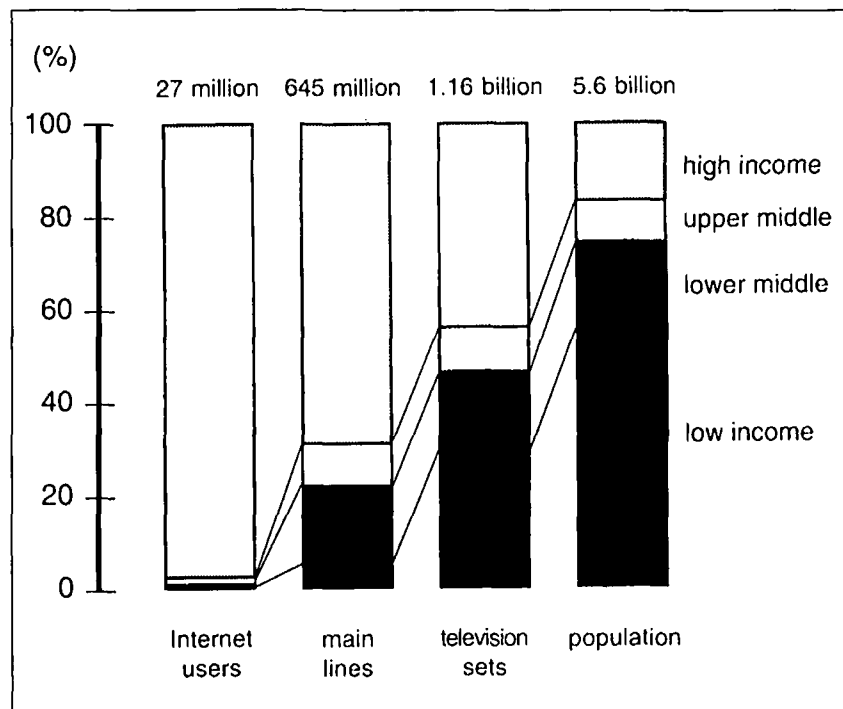


Figure 1. An unequal world.

purposes, based on a flat-rate fee. That means you pay the same whether you use the network for one minute per month or for the whole month. It also means that you pay the same whether the service is store-and-forward or in real time. The paradigm of paying by the minute and by the mile, which

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is the foundation for most services offered by public telecommunication operators (PTO), is clearly being undermined.

PTOs may not be losing much traffic (Fig. 1) to Internet Phone services at present, but they are losing a lot of sleep. The first generation of Internet Phone services offered limited functionality to computer users. The next generation offers interworking between computer users and the public switched telephone network, or some reseller or call-back operator offering services over the public network. That means that all 700 million or so users connected to the public telephone network are reachable from a computer with Internet Phone software for little more than the price of two local calls, one at each end of the call. Using the

Internet for real-time applications could also threaten the revenue streams of future services, such as video-on-demand, music-on-demand, or home shopping, which the PTOs are currently planning, while at the same time testing the market demand. The Internet also provides a viable option for industries involved in the information distribution business, such as software, video distribution, compact discs, or newspapers.

Furthermore, in-company "Intranets," using information search and retrieval systems made popular on the public Internet, could soon be replacing in-company bulletin boards or groupware. In each of these potential markets, the principle of increasing returns to scale applies. This implies that the more people use them, the more popular they will become. Thus, the growth of the public Internet, and user familiarity with browsers, will promote the growth of parallel private Internets. The spread of Internet as an entertainment-based medium will greatly facilitate its acceptance for serious business purposes.

The Internet as Superhighway?

What are the limitations of the Internet? Will it really evolve to match popular expectations of what the information superhighway should be?

- The most obvious limitation is that the information contained on the Internet is unstructured, unsorted, and difficult to find. It is easy to find information that is interesting, even fascinating, but finding the particular fact that you need is often frustratingly difficult. The Internet is like a library run by anarchists in

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which the trivial is filed next to the erudite.

- A second problem is that the Internet comes without any quality of service guarantees. The time delays in accessing particular sites would be unacceptable in a fully commercial service. The danger of messages being intercepted, corrupted, or simply disappearing without a trace is ever present. Nor is there any protection for the user of the quality, reliability, or good taste of the information being accessed. The Internet's reputation as a haven for smutty pornography may be undeserved, but it is difficult to shake off this image in the public's perception.

- A third problem is that the Internet protocol is simply not optimized for multimedia traffic. It proves popular because it is cheap to the end user, not because it is efficient. If you wanted to build an information infrastructure from scratch, you probably would not start out from the 1970s technology of the Internet, were it not for the fact of its established user base. Predictions abound that the Internet

is on the point of collapse, overloaded with teenage home videos or high-resolution satellite images. So far, these predictions have been confounded.

- Finally, despite the exponential growth of the Internet, it nevertheless remains the case that some 97% of Internet users are in the high-income countries that account for just 15% of the world's population. The distribution of Internet access is a lot less equitable than that of the telephone or the television.

Will these problems eventually lead to the collapse of the Internet as we know it, or will it continue to evolve?

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