

If the 1990s were the decade of the web, the 2000s will be the decade of Internet telephony communications. The industry can expect a \$1 trillion change over the decade, with innumerable ways of marketing new voice services. The key to this change is the imaginations of 10 million web designers.

### Recruiting Web Developers

Today, even teenagers have web sites. We are poised to open up the world of communications services to web developers. There is no reason why a web developer, even a teenager, could not come up with specialized answering treatments, download scripts, and create whatever sorts of communication services are interesting in a given week.

Such a scenario is not inconceivable. Remember, in five years the web evolved from the point where most people had never heard of the Internet to the point where even teenagers have web sites. A corresponding change in the communications industry will get us to the point where even teenagers can produce their own services.

### Current Industry Focus

Today's industry focus is on softswitches and on a gradual evolution from the existing intelligent network (IN) to a "decomposed" network. In this model, there is a network operations center or point of presence that incorporates softswitches, application servers, and media servers. There are gateways between the Internet protocol (IP) network and the public switched telephone network (PSTN), but they are all centrally located in the new equivalent of the central office. New applications deployment in the new environment is developed by traditional carriers.

### Growth of the Internet Model

A break will occur, probably beginning within two to five years, creating the conditions for explosive growth based on an Internet model where everything is open. This lack of central control has been very interesting in terms of the five-year transition that happened in the 1990s to the point where anyone can have a web site.

Most of the pieces needed to build a distributed communications infrastructure that could support a transition similar to that of the Internet are in place now through the SIP family of protocols. But questions remain regarding software development tools and adequate QoS.

The SIP family of protocols provides the foundation for distributed call control, just as hypertext markup language (HTML) provided everything necessary for web sites and web browsing. SIP does not directly cover the scripting of prompts and address other factors, but the addition of voice extensible markup language (VXML) moves the industry closer to the turning point.

### QoS Issues

The explosive growth of distributed communications services following an Internet model requires an Internet that provides "adequate" QoS for interactive voice communications. This is not available in today's public Internet. But the cost of providing "gold" bits, i.e. two levels of service, is effectively zero when the percentage of gold bits is less than 15% of the total bits.

Today, data bits are growing at roughly 100 percent per year, while voice bits are growing 8 or 9 percent per year. The crossover point has already occurred, suggesting that voice will represent less than 10 percent of the bits by 2004. With zero costs and a competitive marketplace, subscribers can expect within three years to purchase Internet service for a flat monthly rate that provides today's services, plus the ability to send up to 10 percent "gold" bits for the same flat monthly fee or for an incremental flat monthly fee.

The Internet backbone already has QoS that is adequate for voice telephony. A cable modem, today's backbone, and SIP telephones could deliver toll-quality speech service over today's Internet. QoS is an issue, but not an obstacle.

### Software Issues

A bigger question is that of service creation software. The question is how to harness 10 million web programmers and get them to write communications applications.

SIP is an early attempt to make communications call control available to web programmers, and VXML makes a start toward integrating IVR with call control. Between SIP and various XML derivatives, over the coming two years, everything necessary for web developers to feel comfortable creating applications will likely fall into place.

### A New, Creative Approach

There is a market for services created by individuals, and when 10 million people begin thinking of services, the result will be very different from anything happening today. Such creativity will make the world of communications dramatically different. The Internet model is set to explode, probably within the next two to five years. The transition in communications will be as dramatic as the web transition was between 1994 and 1999.

## The Future Of Communications

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