

Internet Telephony and Its Impacts on Telecommunications Policy in Taiwan

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Introduction

Competition in the telecommunication marketplace has emerged in many fronts. Network infrastructure competition, in particular, the Internet has begun to emerge and gather momentum in many developed nations (Noam, 1995b). As various telecommunications networks converge and compete with each other, new telecommunications services and providers are allowed to enter the telecommunications market once-monopolized by state-owned PTT. As the market shake-out unfolds, consequently, new telecommunication regulatory mechanisms need to be adjusted to cope with this new development.

Although various kinds of new services have been introduced, one of the most promising applications is to use the Internet for voice communication. This new service, properly named Internet telephony, uses a combination of computer programs, hardware, and Internet connection to transform the Internet into a voice communication network. Thanks to this technology, telephone-like digital voice conversations can be transmitted through the Internet in a manner similar to the regular local or long distance telephone networks (Hickling, 1996).

An Overview of Internet Telephony

Internet-based phone communication represents a low-cost alternative to traditional telephone communications handled by local and long-distance carriers. Several companies in the United States have provided the Internet telephony services. These include Internet Phone by VocalTec Inc., Webtalk by Quarterdeck Corp., Intercom by Telescape Communications, and Webphone by Internet Telephone Co. (Verity, 1996). Other endeavors include Netscape Communications, CompuServe Inc., Cyberphone by the Prometheus Products Inc., Free World Dialup, International Discount Telecommunications Corp. etc. (Haar, 1996; Internet User Consortium, 1996).

Internet telephony is a voice-based technology that operates in real-time and by converting voice to electronic signals to transmit them over standard telephone wires. Users need a product that digitizes their voice at one end of the line and decodes it at the other, along with a phone plugged into the computer and an Internet account. The caller on the other end of the line must have an identical setup to receive a call via the Internet

(Piven, 1995). The latest Internet telephony technology has incorporated video that can add the feature of videophone.

The hardware for the Internet telephone application includes a modem, a speedy computer (25 MHz or above), a sound card, speakers, and microphones. A modem with a minimum speed of 14.4Kbps is required to ensure phone quality sound (Savetz & Sears, 1995). Computer programs are also needed to allow users to use the Internet to carry voice telephone calls in place of networks from long-distance carriers. Maven, Netphone, Pgpfone, Cu-Seeme, and Internet Phone are available for the Macintosh computers. Speak Freely, Cu-Seeme, Internet Phone, Digiphone, Internet Global Phone, Internet Voice Chat, Webphone, Webtalk, Softfone, Powwow, Cyberphone, and Intercom can be used on computers running Windows. For computers running Unix, Cyberphone, Nevot, Rat, Vat, Mtalk, and Ztalk are on the market.

Internet Telephony as a New Telecommunications Service

One of the most attractive features of the Internet telephony is the relatively low cost of making phone calls. It enables many Internet users to combine the low cost of Internet connections, the convenience of calling from either PCs or telephones, and the ability to communicate with anybody with a telephone via the existing public switched telephone network (Auchard, 1996).

For heavy telephone corporate users, the Internet telephony presents a very attractive option that makes perfect business sense. Woods (1995) estimated that international telephone callers via the Internet telephone network can save as much as 96% for one call (Shiver, 1996). Jing (1996) also estimated that the pricing structure for the Internet telephony in Taiwan will be solely based on the current pricing model of the Internet. In other words, with a monthly fee of NTD170 and 0.6 dollar per minute (i.e., 0.4 dollar for Internet access fee and 0.2 dollar for a local call), users can make long-distance and international calls at a fraction of the current charge.

In addition, because it is accessed through computer, the Internet telephony service can become more user-friendly, interactive, and individualized than current telephony services. For example, users of the TeleVox software can use the product's voice-effect capabilities, including VoiceFonts^(TM) to apply character "transformations" to their own voices. In addition, Voxware has incorporated a variety of enhanced features into the TeleVox product, including hands-free operation (even in half-duplex mode), caller ID, call blocking, automated login/logout, and user-defined address groups (PR Newswire, 1996a).

The cost-saving of making long-distance or international calls does not merely benefit business users. For example, school children in a rural community could easily and inexpensively communicate with a scientist in a remote location. With the improvement of the Internet infrastructure, their conversation can include video and drawings along with interactive voice transmission. It can help accomplish the goal of universal service.

Another compelling advantage of the Internet telephony is that it will introduce competition into the telephone market. As competition has been long held to increase the efficiency of the telecommunications marketplace (Brock, 1981; Noam, 1995a; Wiley, 1981), allowing emerging technologies such as the Internet

telephony to compete with existing telephone service providers will benefit the public. In spite of these advantages, the Internet telephony still encounters many technical and regulatory obstacles that include transmission bandwidth, machine performance, and corresponding sound quality of the Internet telephone.

Impacts of the Internet Telephony on the Telecommunications Marketplace

Due to the recent popularity of on-line information services, usage of computer and the Internet have dramatically increased in Taiwan. There are over 700,000 users in Taiwan. The number is expected to increase to 3 million by the end of 2000. Many businesses have rushed to the Internet partly because of the commercial potential of electronic commerce. Commercial web sites in Taiwan have increased from 300 to 1150, in a period of one year (December 1995-1996) (Ko, 1997).

With the rapid increase of the Internet population, the introduction of the Internet telephony, therefore, can have severe impacts on the operations of the Chung-Hwa Telecommunications Corp. (henceforth, CHT). As more business and residential users make phone calls via the Internet, revenue of telephone service providers is bound to be taken away. This reduction of revenue can be detrimental to the provision of universal services as more telecommunications competitors are allowed in the market.

The introduction of the Internet telephony will allow the Internet users to bypass CHT's networks. This type of bypassing activity can affect the CHT's operations. Cream-skimming practices by those alternative service providers can further deteriorate their revenue basis. Allowing the operation of the Internet telephony will shift the burden of universal service provision to existing telephone service providers, at the same time, by allowing their revenues to be taken away by these Internet telephone operators.

Although Vinton Cerf downplayed the threat of voice transmissions via the Internet, saying, "This has a 'sky is falling' character to it" (Communications Daily, 1996), one Internet expert estimated that at least 500,000 copies of such software were distributed last year and that as many as four million copies could be in circulation by the end of 1997 (Shiver, 1996). Therefore, it can create a situation detrimental to the provision of universal service which will be mainly provided by the CHT under the current universal service financing mechanism as arranged by current liberalization timetable.

The Impacts of the Internet Telephony on Telecommunications Regulation

The introduction of the Internet telephony will not only accelerate competitions among different types of network operators and service providers, but it also has tremendous impacts on existing telecommunications regulations. In particular, the abilities of the Internet telephony to ignore geographic boundaries and to bypass traditional telephone operator will influence the jurisdictional boundaries between local, national, and international telecommunications regulatory regimes.

Long-distance and international telephone service providers in the United States have felt the impacts of the Internet telephony. As the CHT monopolizes both international, long-distance, and domestic telephone markets in Taiwan, the scenario that local telephone service operators (seven RBOCs and several independent

operators) challenges long-distance and international telephone operators in the US (AT&T, MCI, and operators represented by the ACTA) may not appear immediately. However, as convergence of telecommunications networks and services becomes an unstoppable trend, the liberalization of international, long-distance, and domestic telephone services will be shortened in spite of the 2001 schedule. Therefore, regulators need to think about what type of regulatory mechanisms will be needed to ensure a healthy telecommunication marketplace as competition is expedited by the advent of Internet telephony.

Internet telephony can be best characterized by its ability to facilitate the bypassing activities of current CHT customers. Since its first appearance in 1980 as a public issue in telecommunications regulation in the US, bypassing is often used to refer to the bypassing of one telephone company against another. Not until the emergence of the Internet telephony is this term used to a new type of bypassing activities. Therefore, the history and factors affecting bypassing activity are briefly discussed below.

Bypassing is defined as "the origination and/or termination of telecommunications traffic without the use of telephone company facilities" (Racster, Wong, and Guldman, 1984, p. iii). The FCC narrowly defined "bypassing" as "the transmission of long distance messages that do not use the facilities of local telephone companies available to the general public, but that could use such facilities" (Bolter, McConnaughey, & Kelsey, 1990, p. 230). Internet telephony has included the transmission of voice communications through CHT's networks, without being identified as such.

Depending on how bypassing is defined, bypassing can involve many forms. They include the following: 1) ownership of private systems; 2) subscription to non-LEC bypass services; 3) direct interconnection to interexchange carrier points of presence (Bolter, et al., 1990). Scholars have identified several types of bypassing (Bolter, et al., 1990; Racster, et al., 1984). The following table indicates a categorization by Bolter et al. (1990):

Table 1: Bypass Classification Scheme

Internal Factors		External Factors		
				Economic Factors
				Uneconomic Factors
				Non-economic Factors
Service Bypass	Facility Bypass	Service Bypass	Facility Bypass	

As to consumer's decision to use bypass facilities and services, scholars have identified many factors. Among the demand factors are consumer incentive, government policy, and court decision. Among the supply factors are technological change and alternative communications sources (Bolter et al., 1990). A survey conducted by the National Regulatory Research Institute in 1984 found that there are six factors to determine why consumers want to bypass:

- 1) Availability: Inability of telephony company to provide desired services.

- 2) Reliability: Greater reliability of bypass facilities.
- 3) Flexibility: Greater flexibility of bypass facilities.
- 4) Security: Concern over control, security, and /or privacy.
- 5) Price: Price of telephone company services.
- 6) Stability: Stability of prices over times.

The price of Internet telephone service is low, stable, and secure. It also can be made available to consumers by simple hardware and software requirements. With these advantages, consumers will have many incentives to use this bypassing service.

The US case may serve the best example of how Internet telephony is influencing current telecommunication regulatory mechanism and how stakeholders are responding. The FCC in the United States has held its consistent position to encourage new technological advancements and developments in telecommunications. Internet telephony is treated as a new technology to be nurtured without too much government intervention. However, such exemption from regulation has allowed many users to bypass the networks of existing telephone service providers. As a result, the America's Carriers Telecommunication Association (ACTA), a trade association of 130 competitive, long distance carriers filed a petition to stop the sales of Voice-On-the-Net (VON) software that enables a computer to transmit voice conversations over the Internet (ACTA, 1996a, b; PR Newswire, 1996b). One of the two arguments that ACTA presented is a request for a fair competition in the telephone service market and a fair treatment by the FCC.

Afterward, the FCC also published a public notice to request any interested parties to file statements opposing or supporting the Petitions for Rulemaking listed herein within 30 days. However, current regulatory trends and history of the U.S. telecommunications regulations do not support this type of regulatory proposal. As Elon Ganor, Chairman & CEO of VocalTec, Inc. predicted, "This is the kind of regulation that the US government and people have traditionally criticized third world countries for" (cited in Pulver, 1996). In addition, with a premature regulatory precedent set by the US, the technological potential of the Internet telephony is likely to be reduced.

The Internet telephony poses a bigger issue than the fairness of the competition in the market; it challenges how past regulatory regime was designed and meant to operate.

Relevant issues that need to be pondered include the following:

1. How should new telecommunication service providers be defined and regulated?
2. What new regulatory model to account for a new converging telecommunications landscape can be stipulated to ensure effective operation of the market power.?
3. Whether regulation based on a single application of a single medium should be stipulated?
4. Will this new regulatory mechanism be out-dated immediately as developments in telecommunications and computing progress in a very fast speed?

5. Will this type of regulation hinder technological innovations in both telecommunications and computing industries as the current trend in electronic networking toward multimedia?
6. Will any regulatory mechanisms of the Internet set a poor precedent and hinder the application of the Internet?
7. Whether the regulation of Internet telephony can better serve public interest as telephone conversations could become much cheaper and more efficient if a full competition is introduced into the telecommunications market (Oram, 1996).

Given the limitation of spaces in this paper, only a few issues will be discussed. Without properly defining what constitute so-called telephone service or providers of such services, government regulatory agency will have difficulty regulating them at the first place. In the case of ACTA, the telecommunications regulator, FCC, was asked to "exercise jurisdiction over the use of the Internet for unregulated interstate and international telecommunications services." ACTA argued the Internet telephony providers should be equated with telecommunications service providers and should be regulated by applying for license and paying tariff (Wienfield, 1996). Similarly, in Taiwan, there is the issue of how to define basic and enhanced services in an increasingly converged world. Whether Internet telephony should be categorized as enhanced or basic services will determine how much government regulation will be placed on operators. Up to now, regulatory agency has avoided discussing this thorny issue.

Further, as the Internet gradually becomes an all-encompassing medium whether voice, video, and data can all be transmitted. Innovative services such as Internet broadcasting can put more pressure on current regulatory scheme (Yang, 1997). In the end, regulatory agency may need to consider whether there is a need to "define the type of permissible communication that may be effected over the Internet."

The convergence among different technologies and strategic alliance between companies that are thought to be unrelated five years ago simply complicates the whole regulatory issue. New companies or services will make impossible any attempt void to clearly define and categorize new innovations. As Ganor pointed out when Microsoft and Netscape recently announced an audio and video strategies for the Internet, can these companies be categorized as telecom carriers and should be regulated as such? The line between computer and telecommunications begins to blur (Pulver, 1996).

Any regulatory attempt on the usage of the Internet telephony can have tremendous implications. Imposing either regulatory mechanisms will affect current operations of many Internet companies and ISPs. In spite of potential threat of Internet telephony to its revenue basis, CHT itself has begun to pursue its commercial potential by setting up subsidiaries. As CHT still controls the domestic telephone service market, any revenue increase generated from Internet telephony application can be translated into more revenue from local calls, although revenue loss from the differences between domestic and international telephone calls is expected. However, as CHT loses its monopoly and as more operators are allowed in the international, long-distance, and local telephone services, the same scenario similar to that in the US is likely to occur.

Conclusion

Convergence in the telecommunication and computer industries has complicated the telecommunications regulations in the United States. David Post, visiting associate professor of law at Georgetown University Law Center and co-director of the university's Cyberspace Law Institute, pointed out that current regulatory difficulties are due to a clash between an industry [telecommunications] that has been as highly regulated and an industry [computer] that has been little regulated (Nando Times, 1996). The complexity of this issue will make finding an appropriate regulatory model extremely difficult.

As a technology under development, the Internet telephony encounters many technical limitations and regulatory uncertainties that may hinder its future success. Some critics have pointed out that this application is likely to lose its niche because of the similarities to speakerphones and their problems (Mohan, 1995). Because of such inconveniences, many consumers report that interest in the Internet telephony wanes after an initial burst of enthusiasm among early adopters.

Debates on the Internet telephony regulations can be interpreted from several aspects. First, it is a continuation of the increasing liberalization of the telecommunications marketplace. Since the past decades, the telecommunications market in the United States has become very competitive after some major FCC decisions and the emergence of alternative technologies. The issue of convergence in telecommunications services is limited to wired-line service providers. In fact, the emergence of wireless local loop and PCS system has also contributed to the increasing competition in the telephony market.

Second, telecommunications regulations have been always prompted by technological innovations (Horowitz, 1989; Racster, Wong, & Guldmann, 1984). Some of the best-known cases in the US include the Above 890 decision, the MCI decision, the Specialized Common Carrier decision, Domestic Satellite decision, the Hush-a-Phone precedent, the Execunet, etc. In Taiwan, Liu (1994) has pointed out that new communication technologies will affect future regulatory mechanisms. She therefore argued that government should take a forward-looking role in revising and stipulating regulations to cope with this ever-changing telecommunications scene. The Internet telephony can be seen as a predecessor to future new services of the Internet. Internet television and broadcasting are popular now. Furthermore, the application of the Internet to two-way voice communication also changed the nature of the Internet from "a store-and-forward medium" to a real time medium (Hapgood, 1995). In addition, there is an urgent need to harmonize international regulations regarding the Internet and its applications. All of these changes will need regulators to consider what the face of telecommunications regulations will be in the age of the Internet in Taiwan.

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