Global Communications Newsletter

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The Liberalization of Taiwan's Telecom Market

By Steven Y. Chen, Taiwan

The telecom market in Taiwan was run solely by the state-owned Directorate General of Telecommunications (DGT) for more than 50 years prior to 1996. However, owing to the advent of telecom liberalization, the DGT could not monopolize the market any longer. On 1 July 1996, the DGT was formally transformed into two organizations. One is still called DGT, acting as the regulator of the Taiwanese telecom industry, and the other one, the newly established Chunghwa Telecom, acts as a state-run corporation to offer telecom services in a competitive environment. In this article, I first introduce the regulatory reform and telecom liberalization process, then analyze telecom market trends and business opportunities in Taiwan, and finally give some conclusions.

The telecom liberalization in Taiwan is based on the three revised telecom bills, the Telecom Act, the Organizational Statute of DGT, and the Statute of Chunghwa Telecom, which have been effective since February 1996.

The major revisions to the Telecom Act are:

- Opening the telecom market to the private sector
- Separating business operations from regulatory functions
- Dividing the telecom business into two types: type 1 businesses offer common carrier services and facilities, while type 2 businesses provide any services other than those of type 1, for example, value-added services (VASs)
- Guaranteeing equal network access among different telecom operators
- Limiting foreign investment to 20 percent for type 1 business, but no restriction on type 2 business
- Prohibiting cross subsidization between type 1 and type 2 businesses
- Setting up a universal service fund for supporting telecom services to the remote, mountainous areas and offshore islands.

Currently, the mobile phone is the most competitive service in Taiwan's telecom market. Besides the analog cellular system AMPS (800M Hz), we have two other digital cellular systems in Taiwan: GSM (900 MHz) and DCS (1800 MHz). Our government has issued eight licenses to six private operators for mobile phone service.

The liberalization of mobile phone service invites both local and foreign consortia to work together to explore Taiwan's telecom market. Before liberalization, the amount of mobile phone subscribers was under 1.5 million. However, only one year after deregulation, the accumulated subscribers was more than 4.5 million (as of January 1999) owing to increased competition and promotion. At present, Chunghwa Telecom owns the biggest market share, about 50 percent, with the other private operators holding the other half.

At the end of December 1998, the number of radio paging subscribers in Taiwan had reached 4.3 million. It is forecasted that the growth of radio paging subscribers will slow down in the future owing to the competition of mobile phone service and the opening of low-tier mobile service.

Service	December 1998	December 2001
Mobile phone	4.5 million	6.5 million
Radio paging	4.3 million	4 million
Local phone	11.6 million	13 million
Internet	3 million	6 million

Table 1. *Current and projected markets in Taiwan.*

In the year 2001, local telephone subscribers will reach 13 million. With the opening of fixed-line network services, the intensive use of the Internet and other data communications by dial-up access, we believe that the local telephone market will continue to grow in the future.

In Internet communications, nearly 80 Internet Service Providers (ISPs) have been founded in recent years, including the three largest ones: TANet, HiNet and SeedNet. As of January 1999, there were more than 3 million Internet subscribers registered in Taiwan using dial-up or leased-line connections.

The present and future market sizes of mobile phone, radio paging, local phone, and Internet services is summarized in Table 1.

So far, Chunghwa Telecom has still maintained its healthy and strong status quo after liberalization. Its revenue in fiscal year 1998 increased 14 percent compared with that in fiscal year 1996 (the year before Chunghwa Telecom was founded). This revenue mainly came from mobile and fixed-line phone services, including the local, long-distance, and international phone calls. The pie of Taiwan's telecom market has been growing remarkably since liberalization. Competition has brought more choices and better services to customers at lower prices. The opening of the telecom market also provides many golden opportunities for telecom operators and vendors. It is estimated that in the next five years, up to NT$500 billion will be invested in the domestic telecom market, supporting the R.O.C. government's "Boosting Domestic Demand" policy.

In a word, the telecom market in Taiwan is not saturated yet. The opportunities for foreign telecom operators are:

- Offering type 2 services with no investment restriction
- Entering joint ventures with local consortia to run type 1 business

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Chilean Chapter Developing Global Projects Through ComSoc Activities

By Eduardo S. Vera, Chile

The Chilean Chapter is one of the outstanding IEEE ComSoc Chapters that has promoted its local academic activities for members and maintained or increased the membership as shown in Fig. 1. I have the honor of serving as chair of this Chapter, and also coordinating a national project of global multimedia information systems, called "AccessNova Project," which was developed to make up a global academic linkage of the Asia-Pacific Rim with a superb arrangement of international consent and the active participation of the Communications Society.

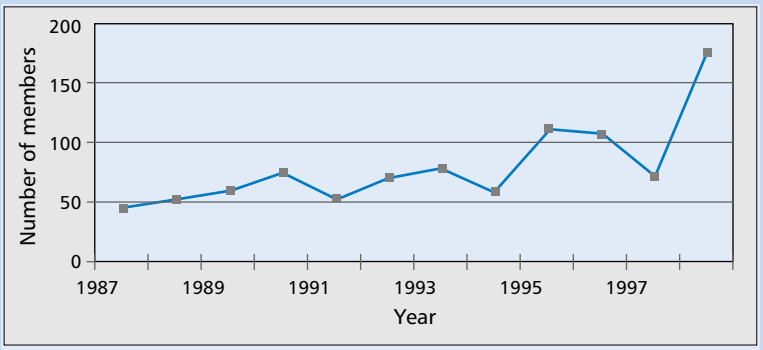

Figure 1. *Membership in the Chilean chapter.*

Given the successful transformation of its telecommunications industry, Chile is in a privileged situation to become a real player in the development of global communications. This is a role that Chile is well prepared to undertake, given the sweeping privatization of its telecommunications industry more than a decade ago, which made it the first country in the region to achieve full deregulation of its telecom market. Indeed, it is a well known fact that over the last few years, Chile has become a world-class telecommunications laboratory, where advanced services can be first deployed and tested for later transfer into the rest of the South American region. As a small country, Chile is fully aware that its only competitive advantage lies in the speed with which it can innovate and develop advanced services fast.

Despite this vision, as an emerging country Chile still lacks the solid R&D infrastructure necessary to foster the development of future telecommunications services. On this aspect, the country is firmly committed to play an active role in international collaboration efforts. The AccessNova Project, begun in November 1994 by the University of Chile and Nippon Telegraph and Telephone Corporation (NTT) as a creative attempt to trigger the early introduction and development of broadband services into the region, is a good example of this approach. During its first stage from 1994–1997, AccessNova built Chile's first experimental high-speed network, allowing the broadcasting of uncompressed digital video using TCP/IP protocols over an ATM platform in early 1996 and connecting Santiago and Tokyo through a high-speed digital link in August 1997, among other experimental milestones. In the early part of its second stage (1998–2001), AccessNova also includes other universities like Federico Santa Maria Technical University in Chile; Waseda University and the University of Electro-Communications in Japan, in collaboration with other companies, such as Compañia de Telecomunicaçiones de Chile, TICE, and Adexus in Chile, and Sun Microsystems and United Technologies in the United States. Having built a powerful communications platform, several groups in these organizations are jointly working in the development of distributed multimedia information systems in various areas of application, such as interactive learning and tele-education, tele-work and tele-assistance, information kiosks, remote monitoring and control over open networks, tele-astronomy, and electronic commerce. Despite the different nature of these applications, all of them address many common technological issues, such as fast access to distributed multimedia data bases, security in open networks, etc.

Considering the potential impact of advanced communications, AccessNova and other national projects such as the high-speed broadband network for the national university system (REUNA2) and the special program to promote the use of internet in elementary and middle education providing network access to all the schools of the country (ENLACES) have received important government support from Chile's National Council for Science and Technology (CONICYT) through special national R&D grants. In fact, the importance of transforming the country into an information intensive society has lately been recognized at the highest political level.

Under these encouraging circumstances, the Chilean Chapter of the IEEE Communications Society, working in close collaboration with the University of Chile, has succeeded in gathering support for several local activities of wide impact in the region. Outstanding among them was the last international conference of the Telecommunications Information Networking Architecture (TINA) Consortium co-sponsored by the Chilean Chapter, an important technical forum which gathered in Santiago, Chile, in November 1997 (TINA'97). The consortium is a global alliance for the research and development of advanced communications, led by the principal telecom operators of the world in a joint collaboration with the major manufacturers of telecommunications and computer equipment. The consortium was established at the end of 1992 in order to develop a universal middleware which would allow the utilization of distributed computing over telecommunication network platforms on a planetary scale. The TINA architecture is based on advanced information technology concepts in the areas of object-oriented computing and distributed processing. This year, the ITU-T Study Group 16 in charge of multimedia standardization held its fourth working meeting in Santiago of Chile on 17–28 May, with the support of the Chilean Chapter as well. Several specialized issues will be discussed on topics like voice codification algorithms, evaluation models for high-speed analog modems, protocols for remote control devices for multimedia applications plus a half-day workshop open to the local audience. The meeting brought about 250 experts from all over the world to Chile, thus adding further incentives to the development of advanced communications in the region.

Contributions from members in all regions are welcome. Proposals and submissions can be sent to Nelson Fonseca, Editor, at gcn@comsoc.org

Distinguished Lecture Tour by Dr. Manu Malek

By Fanny Su, Singapore

In support of the Chapters Coordination Committee (chaired by Kwang-Cheng Chen) of the Communications Society's Asia Pacific Board, our office initiated and coordinated a Distinguished Lecture Tour of the Asia Pacific Region by Dr. Manu Malek.

We were enthused by Dr. Malek's acceptance, as he is well qualified with 20 years of experience in academia and industry, as author, co-author, or editor of many books and technical papers in the areas of communications networks, network operations and management, computer communications, and optimization. He is a Fellow of the IEEE, an IEEE Communications Distinguished Lecturer, and is the founder and Editor-in-Chief of the *Journal of Network and Systems Management*.

Dr. Malek's Distinguished Lecture Tour was on "Hot Topics in Network Management." It covered topics in distributed network management, intelligent/mobile agents, policy-based network management, Directory-Enabled Network (DEN) , and event filtering/correlation. The Distinguished Lecture Tour was made possible through the great organizing efforts and hospitality of our volunteer hosts and their committee members: Ho Hooi Chee of Singapore Polytechnic (Chair for the Communications Chapter, Singapore); Craig Skinner and Enn Vinnal from Telstra Research Laboratories (Ex-Chair and Chair for the Communications Chapter, Victoria); and Chris Waters (Chair for the New Zealand North Section). They arranged for Dr. Malek to visit various institutions and companies, and to view demonstrations of current projects.

The Distinguished Lecture Tour was well attended and received in Singapore (70 attendees), Melbourne (65 attendees), and Auckland (50 attendees) by a good mix of students, faculty members, and industry professionals. The participating Chapters/Sections requested different presentation formats and topic focuses, and gave careful consideration to scheduling in order to attract the greatest number of attendees. Dr. Malek kindly tailored his presentations to meet their needs. Refreshments were organized prior to and during the break of his presentation in order to allow networking among the participants. This was one of the key events planned for new member of the Chapters.

Judging by the attendance numbers, lively enthusiastic discussions, and question & answer sessions following his presentations, Dr. Malek's Distinguished Lecture Tour was a success. All to soon the lectures were over, and requests to provide copies of his slides and laments that they should have scheduled more time were voiced. Interestingly, two attendees flew in from Christchurch (New Zealand South) to attend his lecture in Auckland and requested permission to videotape his presentations for viewing by colleagues back home.

We are thankful to Dr. Malek, our volunteers, and attendees for the time and effort in making this another successful Distinguished Lecture Tour.

Dr. Malek is also the presenter of a comprehensive five-hour CD-ROM tutorial on Network Management sponsored by the IEEE Communications Society and IEEE Educational Activities. The tutorial provides practical motivations, strategies, and tactics for Network Management (NM) and describes NM functional areas, hardware and software architectures, and leading-edge technology and research. This CD-ROM tutorial was released 15 January 1999.

If you would like information on Dr. Malek's CD-ROM tutorial on Network Management, please contact us at the following:

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IEEE Communications Society Meetings and Conferences

By Celia Desmond, Director–Meetings and Conferences, Canada

The ComSoc Meetings and Conferences Department has always been very active and this year is no exception. Each year we are involved with no less than 50 conferences and workshops, providing technical expertise via the technical committees, finding and assisting organizers and committees, and providing the "behind the scenes" administrative support required for an IEEE conference.

We are pleased to be involved in such high quality conferences which provide a valuable service to our members. Our conferences provide technical and business information to the members, as well as a venue for them to meet with colleagues who share similar interests and to discuss current developments. It is an added benefit that the conferences are financially successful, because this then allows us to provide many other benefits to our members, such as funding to Chapters for their projects, or for Distinguished Lecture tours, grants to students and professionals to travel to conferences, awards, etc.

ICC and GLOBECOM remain our primary conferences. The format of these conferences has been gradually changing over the past few years, to one of multiple focused miniconferences. The days of large general conferences seems to have passed. Attendees are expressing their pleasure with the fact that they can find tutorials, conferences tracks, and separate sessions that address their area of expertise. The plan is to continue to evolve large conferences in this direction.

In addition, we run a number of Directed Growth conferences, each dedicated to a specific technical area. INFOCOM, the Conference on Computer Communications, and NOMS/IM, our Network Management conference, continue to be world leaders in their fields. In the wireless area we have two strong conferences, WCNC, which is associated with the PCIA trade show, and ICUPC, which will now be held internationally, since WCNC is based in the United States. MILCOM, which has both classified sessions and public sessions, also continues to be strong.

In addition to these we run a number of smaller conferences in many areas, and a number of miniconferences which are associated with those conferences already mentioned. For example, the Gigabit Workshop has been held in conjunction with INFOCOM for a number of years now, as have a number of workshops at ICC/GLOBECOM and NOMS/IM. Through these smaller ventures we often find that conferences

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MEETINGS AND CONFERENCES/*(Continued from page 3)*

evolve in new technical areas. One such area is the Internet, where a number of activities are pointing to what might be a need for a larger conference in the near future.

Of course, we are faced with a number of issues that must be addressed. Each request for approval of a conference requires that someone on Communications Society staff implement a process to verify that the conference meets all of the rules associated with an IEEE conference. And, of course, this also requires that volunteers become involved to assess the technical merits of the conference, provide technical support, participate in the staff evaluation, and assist the organizing committees when required. Since at the present growth rates we will soon be receiving almost 100 requests for approval each year, this requires a significant amount of staff and volunteer time. In particular, the number of requests for technical co-sponsorship is rising steeply. We have provided technical co-sponsorship to conferences for many years, and of course we will continue to do so. However, each time we do, there is cost involved in terms of volunteer and staff time, with very little return to the Society. Thus we are currently tightening the rules for technical co-sponsorship, and encouraging organizers to select some level of financial co-sponsorship instead. In this way, if the volume of requests remains high, we can hire additional staff resources to carry the bulk of the load.

And speaking of our staff, let me give recognition to some of the people who help us to manage our conferences. Our staff in New York consists of Manager of Meetings and Conferences Tom Stevenson, Gayle Weisman, and Deborah Kingston. Anyone who has organized a conference or workshop can attest to the high value that these people bring to our conferences.

The volunteer department also consists of many qualified and willing volunteers. As Director of Meetings and Conferences, I am pleased to work with a very active Steering Committee composed of Curtis Siller, Bill Robinson, Doug Zuckerman, and Tom Stevenson. This committee addresses strategic issues, major problems, and many of the procedural questions. In addition there are 12 conference Boards, as follows:

Geographic Conference Boards
Asia/Pacific Region: Byeong Gi Lee
Europe/Middle-East/Africa: Horst Bessai
Latin America: Bruno Vianna
North America: Vijay Bhargava

Conference Management Boards
Major Conference Boards
GICB: Terry Kero
INFOCOM: Harvey Freeman
MILCOM: Eugene Ferrari
NOMS/IM: Doug Zuckerman
Wireless Conferences Steering Committee*: Mark Haas
Directed Growth Conference Board: Harvey Freeman

**Ad hoc committee at present*

Session/Product Development Boards
Applications & Systems Engineering: TBD
Fundamental Research: Trevor Clarkson
Product & Systems Development: Tomonori Aoyama
Tutorials: Ben Leon
Exhibit & Patron Programs: Bill Robinson

And this doesn't even mention the hundreds of people organizing the conferences — some of which are mentioned above in this article, and some of which I didn't even manage to squeeze into the allowed space. As you can see we are certainly a dynamic organization, always looking for more willing volunteers to become involved, and always proud of the excellent products our volunteers and staff create and manage.

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TAIWAN'S TELECOM MARKET/*(Continued from page 1)*

- Providing consulting services to local carriers in fields such as management skills, technological knowhow, operational supports, etc.
- Forming strategic alliances with domestic operators to explore the international telecom market.

The telecom market in Taiwan will be completely deregulated by the year 2001. The competition will become more fierce as more newcomers enter the telecom market. Telecom liberalization can spur further advancements in technology and stimulate the expansion of the market's size, thus promoting Taiwan to be a technological island and bringing along economic prosperity. As consumers have dominant power over the market, with increased demand for high-quality, diversified, and seamless services at reasonable rates, telecom services providers will have to compete and cooperate with each other in order to fully address customers' needs. Although the world economy has been struck by a financial storm and is in a recession, the telecom industry is still a booming business. From the above analysis, we realize that the telecom industry in Taiwan has great potential in the future.

The *Global Communications Newsletter* is accessible online at www.comsoc.org/pubs/~gcn