Global Communications Newsletter

November 2003

Development and Regulatory System Reform of the Telecommunications Industry in China

By Liang Xiongjian and Zhang Jing, China

Development of Telecommunications in China

In the last 50 years there has been significant achievement in telecommunications in China. In the early days, after the People's Republic of China was just set up in 1949, it only had a switching capacity of 310,000 lines and 208,750 telephone subscribers. The telephone density was only 0.05 percent. Telecommunications, as a foundational industry, was very unstable at that time. From 1949 to 1977 telecommunications developed very slowly in China because its role in the national economy was not recognized correctly. By the end of 1977, the telephone density was only 0.36 percent, having increased less than 0.02 percent per year. Only since the beginning of reform and opening in China has the significance of telecommunications been recognized gradually. The government brought forward some policies, such as a first installation telephone fee, in order to support the development of telecommunications. These policies have been very important. In Fig. 1, Fig. 2, and Table 1 great changes are clear. Now China has the largest number of telephone and mobile phone subscribers, and the largest Internet service market in the world.

As a whole, since reform and opening, the development of telecommunications has undergone four periods in China.

The first period was from 1978 to 1984. In order to meet the needs of economic development, the State Council offered some special telecommunications policies, such as low taxes. They ended the long period of slow development of telecommunications in China. The main problem to deal with was to relieve the telephone capacity shortage in big cities. Since then, the Ministry of Posts and Telecommunications (MPT) has begun to charge a first installation telephone fee. At the same time, MPT began to actively introduce foreign funding, and modern technologies and management methods to drive the development of telecommunications.

The second period was from 1984 to 1989. In this period, the Chinese economy grew rapidly, and the demands for telecommunications increased speedily. Telecommunications were recognized as a strategic pivot for the national economy, and developed preferentially under some favorable policies approved by the State Council. In addition, local governments also supported its development strongly. All these factors accelerated the development of telecommunications and signaled the beginning of high-speed takeoff of telecommunications in China.

The third period was from 1989 to 1997. In this period, the telecommunications network of China became the second largest in the world. With network development, its management began to step into a new period.

The fourth period was from 1998 to now. With the establishment of China Unicom and more operators, the monopoly in telecommunication services was broken. Competition drives the development of telecommunications in China. Regarding development and competition in the future, especially after China enters the World Trade Organization (WTO), further reforms are ongoing.

Although China's telecom industry has made great achievements, the tasks we face are very difficult. Telephone density in China was only 33.7 percent by the end of 2002. There is a big gap between China and the developed countries. By the end of 2002, 14.7 percent of villages could not get telephone service. Thus, China's telecom industry needs further development. The general goal for 2005 is to satisfy the needs of economic and societal development, and achieve a first-class level of telecom technologies and services.

The Evolution of Regulatory System Reform in China's Telecommunication Industry

There have been several significant events in China telecommunications reform, such as the foundation of China Unicom in 1993, the foundation of MII in 1998, and the reconstruction of China Telecom in 1999 and 2001. After the reorganization in May 2002, the new "5-1" structure was introduced. The six main operators are China Telecom, China CNC, China Mobile, China Unicom, China CRC, and China Satellite.

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	Unit	1990	1995	1996	1997	1998	1999	2000	2001	2002
Telephone subscribers	Million	6.85	40.71	54.95	70.27	87.4	108.8	229.4	323.8	421
Mobile subscribers	Million	0.0183	3.63	6.85	13.23	23.6	43.24	85.3	144.8	207
Internet subscribers	Million	-	0.034	0.16	0.67	2.1	8.9	22.5	33.7	49.7

Table 1. *The development of main telecommunications services in China.*

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(cont'd)

The original China Telecom companies in the south of China use the brand of China Telecom; the original China telecom companies in the north of China are part of the new CNC, as well as the original CNC and Jitong. The kernel of reorganization is to break the monopoly and introduce effective competition into the market. Orderly network competition is the best choice to achieve efficient competition. However, we also face problems such as how to ensure fair competition, how to avoid duplicated construction, and how to provide universal services in a competitive environment.

Reform in telecom operation needs reform in regulation organization and policy. The main point lies in the regulation of market and prices.

In 1998, the Telecom Administration Bureau was founded. It is the regulator of the Chinese telecom market, and is independent of operators and manufacturing companies. We think the telecommunications regulation reform should contain the following:

- Constitute the Telecom Act and make sure the regulator can exert its rights independently.
- Put forward new telecom regulation policies, such as a universal service fund, asymmetric regulation for new operators, and new tariff regulation policy.
- Ensure that the different services can be calculated to prevent cross-subsidization.
- Evaluate the regulation policies and competition situation periodically to let new regulation policies adapt to the current situation.

As the market with the biggest potential in the world, China expects to establish a united efficient telecommunications regulatory body with coordinated operation to ensure a fair, standardized, orderly market environment for competition and set up telecommunication enterprises according to the demands of a modern market economy. By these means, the telecommunications industry will become a new growth point in the national economy and find its position in the international market.

Generally speaking, regulatory system reform has influences such as:

- The divergence between government and enterprise functions will guarantee that fair competition in the telecommunications market is standardized.
- MII will regulate the manufacturing industry of electronic information equipment, telecommunications, and software industries, as well as manage national public telecommunications networks, broadcasting and television networks, and various private telecommunications networks. This complies with the international trend toward convergence of information services and gives much more opportunity for future development of China's information industry.
- As a result of regulatory system reform, it will be much easier to get into the telecommunications market. There will be more enterprises interested in the provision of information services joining the competition in the telecommunications market. These newcomers will challenge the conventional enterprises, and customers will hopefully get more convenient telecommunications services with lower prices and better quality.
- The preparation for the opening of China's telecommunication market. Resulting from worldwide globalization economic trends and the effort of China to join the WTO, the opening of China's telecommunications market is inevitable. By means of establishing a new regulatory body, separating government functions from enterprises, and improving laws and regulations, China will gradually find its way out of the difficulties that have blocked the openness of the telecommunications market for a long time and merge the Chinese telecommunications market with the international one.

Some Issues in Reform

Now China has established a new structure for the telecommunications service market. However, considering the development of telecommunications in China and the challenge telecommunications operators will face, we think reform should go further. For example:

- A legal system should be established as soon as possible, as many experts suggest. A telecommunications law would be an important tool for the regulatory organization to regulate operators in a competitive environment.
- Whether the new market structure can bring fair and just competition is uncertain now, but it is very important to make more effort to establish a competitive environment in China.
- The regulatory system should be improved further, a very necessary issue when foreign telecommunications operators enter the Chinese market.
- Operators should also improve their management systems

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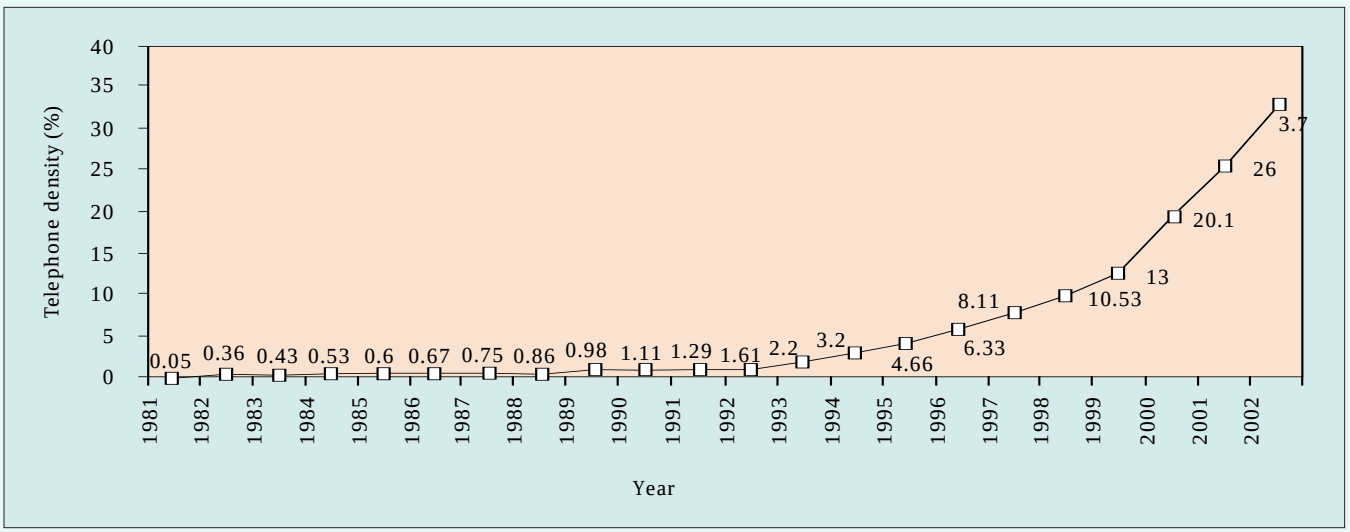

Figure 1. *The development of telephone density in China.*

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(cont'd)

to face competition not only from local operators but also from foreign operators in the future. Foreign operators are very experienced in competition. In an open and competitive environment, the Chinese operators will undergo a learning process in order to compete with experienced foreign operators.

To conclude, we hope that regulatory system reform will lead to a prosperous future for the telecommunications industry in China.

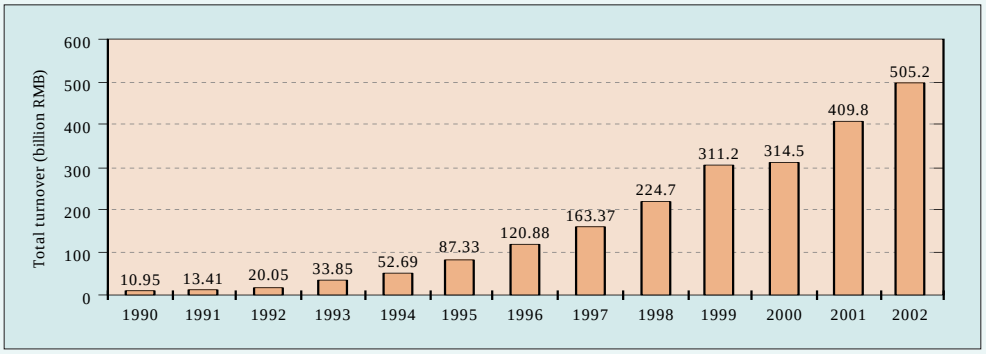

Figure 2. *The developing trend in total turnover of telecommunications in China.*

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Message from the Editors and Call for Papers

By Joan García-Haro, Editor, and Francisco J. González-Castaño, Associate Editor

The scope of *GCN* as a transnational global *IEEE Communications Magazine* section is necessarily broad by nature, but of course must maintain its telecommunications-oriented sense and quality. Indeed, it is open to contributions from any reader with projects, information, and knowledge relevant to communications.

GCN is a descriptive, concise, immediate way to disseminate informally information about stimulating projects, applications, and ideas of general interest, and a forum for dialog on telecommunications-related topics of current interest.

We include in this message a CFP to remind our readers of the global and open extent of *GCN*, and the desirability of broadening the range of contributions to appropriately increase the diversity of articles of interest. We consider that a good test of the success of a *GCN* article is to answer yes to the question: Can a *GCN* reader extract information from this short paper that will improve her/his knowledge on the topic and increase her/his curiosity to look for more data on this issue?

An affirmative response will also ensure our success as Editors.

Call for Papers

Global Communications Newsletter seeks original papers of general interest in the field of communications and related areas.

GCN topics include, but are not limited to:

- National and regional developments in communications technologies, services, markets, and standards
- Pilot experiences in communications
- Communications research and development
- Reports on national and international large-scale projects (e.g., NSF, EU IST)
- Telecommunications convergence, regulatory, and legal matters
- Information and knowledge society
- New applications of communications in politics, health, education, commerce, security and defense, surveillance, agriculture, standard of life, handicapped people care, industry, tourism, space, transportation and navigation, environment, sustained development, globalization, and other areas
- Research trends
- Market trends
- Historical perspectives in communications
- Education in communications
- Reports on key workshops or conferences
- ComSoc Chapter activities

Authors willing to present research results in communications are encouraged to avoid exhaustive or theoretical descriptions and focus on the general interest of their work. In that case, they should cite the sources (project URLs, journals, conference proceedings) where detailed descriptions can be found.

Authors willing to submit reports on workshops or conferences are especially encouraged to do so for IEEE-backed ones, although *GCN* is open to disseminate the conclusions of any event in the field of communications.

Please check previous issues of *IEEE Communications Magazine* or contact Joang.Haro@upct.es or javier@det.uvigo.es with any questions about the suitability of a paper.

Prospective authors should prepare their manuscripts in plain ASCII or MS Word format, with a maximum length of 1200 words, and send them to either of the submission addresses below. MS Word files may have pictures and tables embedded (subtract 200 words for each figure or table). Alternatively, provide these as separate files using any standard coding. Only send screen dumps if strictly necessary, since they will be subjected to a minimum resolution of 300 dpi in the final version.

Submission addresses:

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News from Singapore

By K. R. Subramanian, Singapore

More Singaporeans are jumping on the "broadband wagon." A recent survey on broadband and wireless usage conducted by the Infocomm Development Authority of Singapore (IDA) has revealed that nearly 1.24 million Singaporeans are broadband users. They are going online for music, shopping, banking, and games. This means two out of five people, about a 30 percent increase from 2001.

Mr. Khoong Hock Yun, Assistant Chief Executive of IDA, has said, "The 30 percent increase in broadband users shows that broadband has come of age in Singapore as a pervasive mode of high-speed connectivity. This bodes well for Singapore's vision to see 50 percent of our households on broadband by 2006."

A research study indicates that the number of broadband subscribers in Singapore will exceed 400,000 by the end of 2003, up 84 percent from 2002. Broadband revenues will also pass US$200 million. The research house sees that there will be more than 1.3 million broadband subscribers in Singapore by 2007, with revenues passing US$668 million.

Mobile Computing

One in eight Singaporeans see a need for wireless LANs to be installed at public places. Thirteen percent of Singaporeans telecommute. Singapore is projected to have the third largest WLAN subscriber base in Asia-Pacific outside of Japan. Gross revenue is predicted to rise from US$94 million in 2002 to US$307 million in 2006.

Electronic Commerce

Singapore's electronic commerce environment has taken a significant leap forward with the recent signing of the U.S.-Singapore Joint Statement on Electronic Commerce. The joint statement reflects both countries' beliefs that the private sector should take the lead in developing electronic commerce and establishing electronic business practices.

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Technical Report on HSNMC 2003 July 23-25, 2003, Estoril, Portugal

By Mario Freire, Portugal, and Pascal Lorenz, France

The 6th IEEE International Conference on High-Speed Networks and Multimedia Communications (HSNMC 2003) took place July 23–25, 2003, in Estoril, Portugal. It gathered approximately 90 participants from 22 different countries (see http://www.co.it.pt/hsnmc03.html).

The objective of the conference is to (1) promote high-speed networks and multimedia communications related research and development activities, and (2) to encourage communication between researchers and engineers working in the field throughout the world. Colleagues from academic and industrial networking research communities had a good opportunity to exchange their ideas and opinions during the conference.

The conference program covered a variety of research topics of current interest, such as integrated and differentiated services, quality of service, multicasting, peer-to-peer networking, network and information management issues, WDM networks, optical switching and performance monitoring, CDMA, wireless networks, real-time issues and protocols for IP networks, voice over IP, multimedia streaming, video, TCP performance, and traffic models.

The first day featured two tutorials:

- IP-Oriented QoS in Next Generation Networks: Application to Wireless Networks, by Pascal Lorenz, University of Haute-Alsace, France
- Mobile Ad Hoc and Sensor Networks, by Prasant Mohapatra, University of California, Davis, United States

On the second and third conference days, three keynote speeches were given:

- QoS/SLA Challenges in Networks Based on Intermittent and Partially Available Services, by Petre Dini, Cisco Systems, Inc, United States and Concordia University, Canada
- Intelligent MicroPhotonics for Next Generation Network and Communication Systems, by Kamran Eshraghian, Edith Cowan University, Australia
- Trends on Visual Representation for Multimedia Communications, by Fernando Pereira, Instituto Superior Tecnico — Instituto de Telecomunicaões, Portugal

We would like to thank the members of the International Program Committee and the members of the Board of Additional Reviewers. Without their support, the program organization of this conference would not have been possible. We are also indebted to many individuals and organizations: IEEE, IEE, Instituto de Telecomunicaões, Springer-Verlag, Fundacao Luso-Americana para o Desenvolvimento, and ONI. In particular, we thank the members of the Organizing Committee for their help in all aspects of the organization of this conference.