SHAPING THE INTERNET IN CHINA

Evolution of Political Control over Network Infrastructure and Content

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Since the early 1990s, Internet use in the People's Republic of China (PRC) has grown at a tremendous pace. As of early 2001, official estimates indicate there were some 22.5 million Chinese with online access, and some 200 million users are forecast by 2005. Over the past two years, the country's international data bandwidth has expanded by a factor of 20 and more than 300 cities obtained high-speed connections to the network. In early 2001, there were some 1,500 e-commerce web sites.[1]

To a great extent, the Chinese government deserves praise for rapidly building the data network and seeing that access is being granted to a quickly expanding number of the country's population. The struggle for control of cyberspace information, physical data pipelines, and network revenue, however, will have a significant effect on the network's growth into the coming decade. The evolving demographics of Internet users and ways information

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1. Hou Mingjuan, "Online Business Sees Rise," *China Daily*, April 6, 2001, p. 1.

is transferred within Chinese society are also shaping government attitudes toward regulation of the data highway.

This article examines three key factors that shape how the network is controlled in the PRC. First, it discusses physical network control, asking who built the actual data pipelines through which information flows, and who now regulates and profits from these systems? And how do different parts of the government as well as the private sector vie for control of the network infrastructure? Second, we examine network content control. Who is able to post and send information across the network, and what political limits are placed on this content? What government/private sector dynamics affect competition for web audiences, and how do revenue flows affect content-providing companies? How do user demographics determine content, and how does user reaction to content shape sociological patterns that, in turn, influence the degree of government control over what appears on computer screens? Finally, we also consider the element of foreign influence on the network: how does foreign web content affect Chinese viewers, and what are prospects for change in the near future? How will China's entry into the World Trade Organization (WTO) affect foreign participation in managing the physical network?

As the article will show, there are several areas in which these three factors overlap. The result of the competing forces will both shape the ways the Internet is controlled in China and determine what network users are allowed to see. But before turning to our detailed discussion of the Internet, we first consider related work on control of other forms of media in China. What role has the government played in these arenas, and what implications do these actions have for the new data network technology?

Past Studies of China's Media and the Internet

Early studies of post-Mao Zedong China's media focused on the evolving roles of print and television. They examined both the patterns of government control and the ways content developed as the new Deng Xiaoping reformist regime liberalized means of distributing information. Leonard Chu found evidence that media content in the 1990s had changed significantly since Mao's death in 1976.[2] He noted the appearance of letters of complaint in newspapers, radio programs with free discussion of family social problems, and even soft-core pornography in some magazines. However, he described the Chinese Communist Party as "the owner, manager, and the practitioner" in the media sector and pointed out that no private media organizations had yet

2. Leonard L. Chu, "Continuity and Change in China's Media Reform," in *Journal of Communication* (*JOC*) 44:3 (1994), pp. 4–21.

appeared.[3] Paul Lee chronicled the growing number of television entertainment programs in the early 1990s, proposing that small-group discussion of broadcast fare had the consequence of building social consensus and, in turn, social stability.[4] Joseph Chan examined foreign influence on China's media organizations and found domestic broadcasters, particularly in the south, sometimes improved their content when faced with outside challenges.[5]

Studies from the later 1990s show continued transformation in these media tools. Junhao Hong saw openings to Western television programming as dependent on both domestic supply and demand, as well as on the liberal-conservative conflicts at top levels of the central government propaganda organs.[6] Overall, improved domestic content seemed to be creating a viable rival to imported programming. Finally, Daniel Lynch discussed trends in censorship of books, film, and also early Internet information up to 1997.[7] He found many avenues through which these various media could circumvent government restrictions on both domestic production and import of foreign content.

The first works focusing specifically on the expansion of the Internet in China mainly came from those in the communications field. Scholars such as Zixiang Tan and Wu Wei have written on the early growth and expansion of the data network.[8] Their work gave a thorough technical discussion of the Internet's first years, serving as a useful guide to some of the intra-governmental rivalry as the network grew in the early 1990s. However, these writers generally avoided discussion of other sociopolitical factors such as censorship, use of the network for information distribution, and regional access discrepancies. Other earlier writers, such as Bryce McIntyre, focused almost exclusively on the network's hardware.[9]

Recent work by Geoffry Taubman tries to put Internet development in a context of social change and threats to government control. He asserts the

3. Ibid., p. 8.

4. Paul Siu-nam Lee, "Mass Communication and National Development in China: Media Roles Reconsidered," ibid., pp. 22–37.

5. Joseph Man Chan, "Media Internationalization in China: Processes and Tensions," ibid., pp. 70–88.

6. Junhao Hong, *The Internationalization of Television in China* (Westport, Conn.: Prager Publishers, 1998).

7. Daniel C. Lynch, "Dilemmas of 'Thought Work' in *Fin-de-Siecle* China" *China Quarterly*, no. 157 (March 1999), pp. 173–201.

8. Tan Zixiang, "China's Information Superhighway," *Telecommunications Policy* 19:9 (1995), pp. 721–31; Wu Wei, "Great Leap or Long March: Some Policy Issues of the Development of the Internet in China," *Telecommunications Policy* 20:9 (1996), pp. 699–711; and Tan Zixiang, "Regulating China's Internet," *Telecommunications Policy* 23:3–4 (1999), pp. 261–76.

9. Bryce T. McIntyre, "China's Use of the Internet: A Revolution on Hold" in *Telecommunications and Development in China*, ed. Paul S. N. Lee (Cresskill, N.J.: Hamption Press, 1997), pp. 149–69.

communist government's hold over domestic affairs would eventually be diminished because of the new technology.[10] Taubman's work, however, fails to consider the demographics of current network users, or of the ways network subscribers are actually using instruments such as chat groups for social activity. He also gives relatively little attention to contradictions within the Chinese government or between China and foreign investors seeking to shape and profit from the Internet's development.

Milton Mueller and Zixiang Tan as well as Daniel Lynch all consider the ways the government controls the Internet, with the first two reseachers' joint-authored text concentrating on the physical network and the latter's on content.[11] The Mueller-Tan study chronicles telecommunications ministerial control up to mid-1996 but does not anticipate the later moves by the Ministry of Information Industry (MII) to assert dominant control over international data traffic. The authors also wrote before the proliferation of content-providing companies in China, and when the whole nation had only some 20,000 users. They therefore have little analysis of the social impact the technology would have on a larger population, and predicted that "foreign sources of information will be heavily restricted."[12] Lynch's study gives a more recent overview of Internet control, focusing on ways users can bypass government restrictions on access to foreign content. However, he also gives little attention to viewer characteristics or actual information seen by the users, and omits mention on newer ways to avoid government blocking of web sites.

More recent work by William Foster and Seymour Goodman provides a good overview of recent developments and a fine case study of Guangdong Province. This work tends, however, to give greater weight to technical features of the network and is partly predicated on a set of international comparative standards, some of which seem peripheral to analyzing China's network development. [13]

Many of the analytical works on the Internet published in Chinese for a domestic PRC audience tend to be relatively policy neutral. A book on telecommunications by Xiangdong Wang includes some focused attention to the information network's technical growth but omits most discussion of the political conflicts related to the Internet's development and has little on the

10. Geoffry Taubman, "A Not-So World Wide Web: The Internet, China, and the Challenges to Nondemocratic Rule," *Political Communication*, vol. 15 (April 1998), pp. 255–72.

11. Milton Mueller and Zixiang Tan, *China in the Information Age* (Westport, Conn.: Prager Publishers, 1997); and Lynch, "Dilemmas of 'Thought Work'."

12. Mueller and Tan, *China in the Information Age*, p. 98.

13. William Foster and Seymour E. Goodman, *The Diffusion of the Internet in China* (A Report of the Center for International Security and Cooperation, Stanford University, November 2000).

social implications of the communications web's growth.[14] Other writers praise the general knowledge benefits the Internet promises larger society, explore potential boosts the network will bring to economic planning, note the benefits for natural science research, and point out the advantages of electronic commerce.[15] Work by Li Luting, however, does touch on some social problems of the information age related to young women.[16]

Though some of the Western and Chinese authors examine political and sociological issues related to the Internet's growth, none of the writers focus on the ways network access may affect the formation of organizations functioning autonomously from government control. Past work on the formation of such civil society groups by authors including Margaret Pearson, B. Sun, Jonathan Unger, and Minxin Pei were composed before Chinese enjoyed broad access to the Internet.[17] This earlier research on the growth of a civic consciousness found nascent autonomous social groups had little actual freedom from central control and lacked financial resources to develop their influence. Our own work analyzes the potential for independent group formation in light of the new technological tools, such as chat groups and e-mail, that the Internet now offers.

For comparative analysis, we find some recent work on the ways the Internet can affect U.S. society. Norman Nie and Lutz Erbring asserted that network users spend so much time in front of their computer screens that they actually have fewer opportunities to personally interact with other human be-

14. Xiangdong Wang, *Xinxihua: Zhongguo 21 shiji de xuanze* [Informatization: China's choices in the 21st century] (Beijing: Shehuikexue Wenzhai Chubanshe, 1998).

15. Jin Wulun, "Kexue shehuixue yu keji zhengce" [Scientific sociology and technology policy], *Ziran bianzhengfa tongxun* [Natural dialectic communication], no. 5 (May 1996), pp. 22–31; Song Shiping, "Internet yu tongji xinxi tongxin wanglu jianshe" [The Internet and construction of the statistical information network], *Tongji yu xinxi* [Statistics and information], no. 1 (January 1997), pp. 28–29; Zhao Wenli and Zhi Lihong, "Dianzi wanglu yu kexue gongzuo de shehui jiegou" [The electronic network and social construction of scientific work] in *Ziran bianzhengfa tongxun*, no. 7 (July 1998), pp. 42–47, 51; and Rui Mingjie, "Hulianwang lingshouye fazhan tansuo" [Exploration of Internet retail industry development], *Shangchang xiandaihua* [Market modernization], no. 4 (April 1998), pp. 10–12.

16. Li Luting, "Xinxi shehui yu qingnian nuxing wenti" [The problems of the information society and female youth], *Zhongguo qingnian zhengzhi xueyuan xuebao* [The Chinese youth policy institute journal], no. 1 (January 1998), pp. 24–28.

17. Margaret Pearson, "The Janus Face of Business Associations in China," *Australian Journal of Chinese Affairs* (January 1994), pp. 25–46, and idem., *China's New Business Elite* (Berkeley: University of California Press, 1997); B. Sun, "Xiangzhen shetuan yu Zhongguo jiceng shehui" [Township associations and the Chinese society at the grassroots], *Chinese Social Sciences Quarterly* (H.K.) (Autumn 1994), cited in Minxin Pei, "The Growth of Civil Society in China," in *China in the New Millennium*, ed. James Dorn (Washington, D.C.: Cato Institute, 1998); Jonathan Unger, "Bridges: Private Business, the Chinese Government and the Rise of New Associations," *China Quarterly* (September 1996), pp. 795–819; and Minxin Pei, "The Growth of Civil Society in China," pp. 245–66.

ings.[18] Their study implied that future U.S. society could be "atomized" as more of the population spends greater amounts of time shopping, doing research, and finding entertainment on-line. Of course, the new communication tool also provides opportunities for virtual communities through such tools as e-mail bulletin boards and chat groups. We can also assess Chinese Internet development in the context of these sociological assertions.

In focusing on recent development of Internet control in China and considering past studies of Chinese media as well as theoretical work on social effects of the data network, our own work fills several gaps in the political and sociological literature. We begin with an overview of the control over the Internet's physical growth over the past decade.

Construction and Control of the Physical Network, 1987–2000

The U.S. data network initially was conceived as a defense-related communications system but quickly became a tool of academia in its early public deployment. Similarly, China's first efforts at creating a data network were focused mainly on scholarly exchange of information. The country's first computer networks, the "China Academic Network," or CANet, and the Institute of High Energy Physics (IHEP) network, in Beijing, were established in 1987.[19] By the following year, the CANet system began sending international electronic mail through a gateway in Germany. At the same time, the organization chose "cn" as the PRC's national domain name.

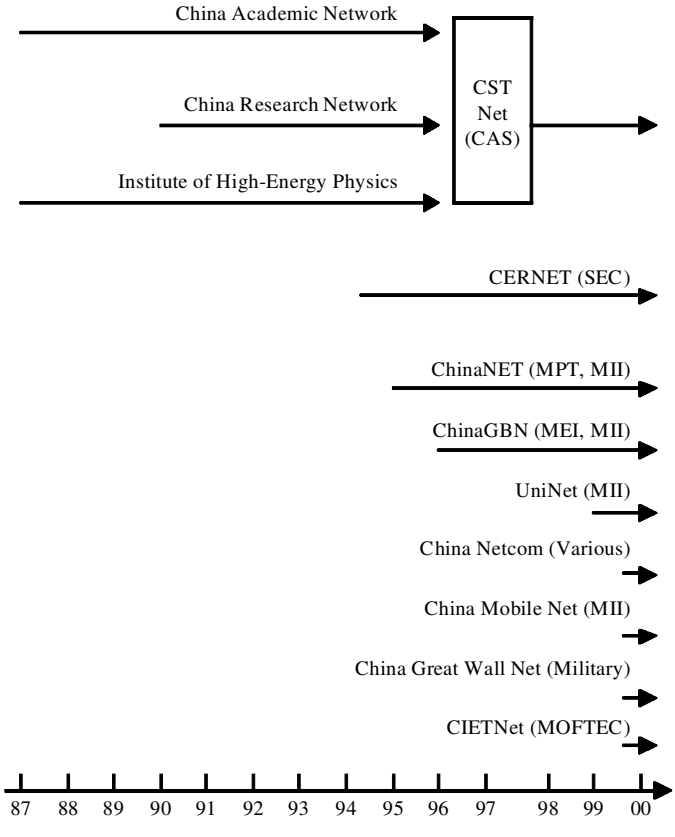
In the early 1990s, other educational networks arose to complement the first systems. The China Research Network, or CRnet, was established in 1990 and began by hosting more than 10 research institutes. The IHEP began using the international Transmission Control Protocol/Internet Protocol (TCP/IP) standard, with a link to Stanford University in 1994. In 1996, the CANet, CRnet, and IHEP were combined, under the auspices of the Chinese Academy of Sciences (CAS), to form the China Science and Technology Network (CSTNet). Figure 1 summarizes the introduction of the various network corporations in the late 1980s and 1990s, with information about the regulating authority of the government for each.

The State Education Commission (SEC) began building its own China Education and Research Network (CERNET) in 1993. It constituted a nationwide backbone with further international links. CERNET's goal was to connect all of the country's universities and, later, secondary and even

18. Norman Nie and Lutz Erbring, *Internet and Society: A Preliminary Report* (Stanford, Calif.: Stanford Institute for the Quantitative Study of Society, February 17, 2000).

19. Some of the following history is derived from Mueller and Tan, *China in the Information Age*, pp. 81–91.

FIGURE 1 *Evolution of Academic and Commercial Interconnecting Data Networks and Their Regulators, 1987–2000*



SOURCE: For information prior to 1997, see Duncan Clark, Alexandra Rehak, and Ted Dean, *The Internet in China* (Beijing: BDA China Ltd., 1999), p. 60. For information on Uninet, see China Internet Information Center (CNNIC), "Semi-Annual Survey Report on Internet Development in China," Beijing, January 2000, at <http://www.cnnic.net.cn/Develst_e/cnnic2000_e.htm/>. For post-1999 networks, see interview with CNNIC representative, by Harwit, in Honolulu, Hawaii, January 10, 2001.

NOTE: Regulating authority is listed in parentheses. CAS = Chinese Academy of Sciences; SEC = State Education Commission; MPT = Ministry of Posts and Telecommunications; MII = Ministry of Information Industry; MEI = Ministry of Electronics Industry; MOFTEC = Ministry of Foreign Trade and Economic Cooperation.

primary schools to one network. Early control of the data network, then, generally fell under the auspices of the educational and academic sectors of the central government. Funding for CERNET's expansion, however, came from the larger central government budget. Perhaps more importantly, the network depended on lines leased from the state telecommunications regulator, the Ministry of Posts and Telecommunications (MPT), which in March, 1998, was reorganized as the MII.[20]

In 1993, a major change in network control and development began, as the MPT started to build its own packet-data network, CHINAPAC. By the early 1990s, the commercial value of packet-data service provision had become apparent to government telecommunications officials and they moved to harness the burgeoning data transmission industry with their own competing network. Newly appointed MPT minister Wu Jichuan, a life-long telecommunications bureaucrat, had taken the ministry's helm at this important juncture and became a leading advocate of the ministry's maintaining control in virtually all areas of voice and data communication.

Two years later, the MPT's renamed network, ChinaNET, was launched and charged with providing public commercial services. The company was licensed as one of the government's major interconnecting networks and acted both as a wholesale provider of Internet bandwidth as well as a brand name for the regional provincial telecommunications administrations (PTAs) to offer their own retail service provision. Early ChinaNET customers were to be state corporations, private companies, or wealthy individuals who could afford connection fees.[21]

The MPT, however, had other ministerial rivals for control of China's data networks. The Ministry of Electronics Industry (MEI), began to compete with the MPT by creating a new corporation in late 1993. Called Jitong, it was meant to be a satellite-based telecommunications network that used the MPT's land-based telephone lines for customer local access. The new company's larger mission was to promote the so-called "Golden Projects," ones intended to link China's customs and financial networks and provide vital information for users across the nation. Jitong's ChinaGBN (short for "Golden Bridge Network") data web was established in 1996. The MEI project was also seen as a top-level State Council attempt to instill some competition to the telecommunications sector. The Electronics Ministry's telephone operating company, China Unicom, and Unicom's new network, UniNET,

20. Interview with Chinese Academy of Social Sciences researcher, by Harwit, Beijing, May 19, 1999.

21. Zixiang Tan, "Internet in China," *Pacific Telecommunications Conference Proceedings* (January 1996), p. 624.

were similar ventures created to challenge the monopoly MPT and its telecommunications corporation, China Telecom.[22]

A new rival emerged in mid-2000, as China Netcom began operation of yet another data network. The company began clearly outside of MII control, with its managing partners consisting of Shanghai's municipal Information Technology Office; the Chinese Academy of Sciences; the State Administration of Radio, Films, and Television (SARFT); and the Ministry of Railways. The latter, which has its own fiber optic network, reportedly supplied 420 million yuan (US$50.6 million) to the new corporation. Netcom's chances for success increased as President Jiang Zemin's son, U.S.-educated Jiang Mianheng, vice-president of the CAS and concurrently head of the Shanghai technology office, took an active interest since both of his organizations had a financial stake in the new company.[23]

In late 2000, three new networks appeared. These included the mobile phone operating company China Mobile's CMNet, military-controlled telecommunications company China Great Wall's CGWNet, and the Ministry of Foreign Trade and Economic Cooperation's CIETNet. Each of these new networks had specific target audiences: for China Mobile, wireless Internet users would be a future market, while the foreign trade network would focus on international trade electronic commerce, and the military network would be used primarily for defense-related purposes. Of course, each could look for larger customer bases in the future, although an already crowded field, as well as special restrictions such as those limiting the role of the military in the civilian economy, would put limits on the new entrants.

As of early 2001, then, China had no less than nine interconnecting networks. Table 1 gives details of each network's recent expansion. It uses international bandwidth (the size of their connections to the international data network) as a measure of their ability to channel information. The CERNET (under the Ministry of Education) and CSTNet (run by the Chinese Academy of Sciences) remained academically oriented networks, but each now have only about 2% to 4% of China's total international bandwidth of 2,799 Megabits per second (Mbps). Jitong's ChinaGBN had a capacity of 148 Mbps (some 5% of the total) and UniNet (which began operations in 1999 under China Unicom) had 55 Mbps, about 2%.

22. For detail on the conflict between the MPT and China Unicom in the mid-1990s, see Eric Harwit, "China's Telecommunications Industry: Development Patterns and Policies," *Pacific Affairs* (Summer 1998), pp. 175–94; and Daniel C. Lynch, *After the Propaganda State: Media, Politics, and "Thought Work" in Reformed China* (Stanford: Stanford University Press, 1999), pp. 165–75.

23. Jonah Greenberg, "China Netcom: The Little Telecom That Could," Virtual China home page, December 7, 1999 <http://virtualchina.com/infotech/news/stories/120799-netcom.html>.

TABLE 1 *Major Networks and Their Leased International Bandwidth, 1998–2000* (in megabits per second)

Month/Year	*Network*	*Bandwidth (Mbps)*	*% of Total Bandwidth*	*Total Bandwidth*
June 1998	CSTNet	2.1	2.5	84.6 Mbps
	ChinaNET	78.0	92.2	
	CERNET	2.3	2.7	
	ChinaGBN	2.3	2.7	
December 1998	CSTNet	4.0	2.8	143.3 Mbps
	ChinaNET	123.0	85.9	
	CERNET	8.0	5.6	
	ChinaGBN	8.3	5.8	
June 1999	CSTNet	8	3.3	241 Mbps
	ChinaNET	195	80.9	
	CERNET	8	3.3	
	ChinaGBN	18	7.5	
	UniNet	12	5.0	
December 1999	CSTNet	10	2.8	351 Mbps
	ChinaNET	291	82.9	
	CERNET	8	2.3	
	ChinaGBN	22	6.3	
	UniNet	20	5.7	
June 2000	CSTNet	10	0.8	1,234 Mbps
	ChinaNET	711	57.6	
	CERNET	12	1.0	
	ChinaGBN	69	5.6	
	UniNet	55	4.5	
	China Netcom	377	30.6	
December 2000	CSTNet	55	2.0	2,799 Mbps
	ChinaNET	1,953	69.8	
	CERNET	117	4.2	
	ChinaGBN	148	5.3	
	UniNet	55	2.0	
	China Netcom	377	13.5	
	CIETNET	4	0.1	
	CMNET	90	3.2	
	CGWNet	0	0	

SOURCES: For June 1998, see CNNIC, "Statistical Report of the Development of the Chinese Internet," Beijing, July 1998, at <http://www.cnnic.net.cn/Develst_e/English(9807).html/>; for December 1998, idem., "Statistical Report of the Development of China's Internet," January 1999, at <http://www.cnnic.net.cn/Develst_e/English(9901).html/>; for June 1999, idem., "Semi-Annual Survey Report on Internet Development in China," July 1999, at <http://www.cnnic.net.cn/Develst_e/1999-7/1999-7.htm/>; for December 1999, idem., "Semi-Annual Survey Report on Internet Development in China," January 2000, at <http://www.cnnic.net.cn/Develst_e/cnnic2000_e.htm/>; for June 2000, idem., "Semi-Annual Survey Report on the Development of China's Internet," July 2000, at <http://www.cnnic.com.cn/develst/e_cnnic200007.shtml/>; for December 2000: "Semi-Annual Survey Report on Internet Development of China's Internet," ibid., January 2001, at <http://www.cnnic.net.cn/develst/e-cnnic200101.shtml/>.
NOTE: Rounding numbers causes some distortion in totals.

The major player in running China's network, however, was ChinaNET, under the leadership of China Telecom, itself nominally controlled by the MII. With 1,953 Mbps of bandwidth, the company had nearly 70% of the nation's total international connection capacity. This allowed it near-monopoly control over China's data "pipelines" for international communication. Furthermore, as of mid-2000, ChinaNET offered connectivity in some 230 cities, using E-1 (2,048 Mbps) data lines.[24]

In the 1998 reorganization of the telecommunications sector, the MEI was merged with the new information industry ministry, which was now headed by former MPT chief Wu Jichuan. Jitong and Unicom were absorbed along with the rest of the MEI into the MII, meaning that Jitong's ChinaGBN and UniNet also come under MII authority. With the incorporation of the former State Council Information Leading Group into the new ministry, the MII emerged uncontested as the data systems' main regulator and policy director. Minister Wu, known for his fierce desire to maintain control over the course of the telecom sector, thereby assumed a role as the PRC's information czar. He and the MII would use this control at lower levels, such as for direct provision of Internet service to business and private consumers. The growth of these service providers is discussed in a later section.

As Table 1 indicates, however, ChinaNET's share of bandwidth did fall in the late 1990s as such rivals as ChinaGBN and UniNet increased their bandwidth capacity. The entry of China Netcom, with 377 Mbps international bandwidth capacity (mainly via its Shanghai connection) and high-speed OC-48 data lines represented a fresh challenge to ChinaNET and revealed a new, potentially significant inter-ministerial rivalry. Still, the MII's early plans to capture control of the network had resulted in its holding the lion's share of international bandwidth control as well as a significant hand in domestic Internet traffic. More importantly, it used its bandwidth control and widely developed network to garner a major portion of network user revenue, as the following section indicates.

Growth and Control of Internet Service Providers, 1995–2000

Though ChinaNET and the other data networks controlled large-scale information backbones, most of the direct sales of Internet service were left to retailing service providers. As noted above, ChinaNET in particular worked mainly as a wholesale network manager and leased its lines to provincial and other regional providers in cities across the country.

The need for a growing number of Internet Service Providers (ISPs) began with the explosion of Internet user numbers in the late 1990s. As of 1994,

24. Foster and Goodman, "The Diffusion of the Internet in China," p. 50.

there were only some 1,600 users in the entire PRC. By the end of 1996, however, there were 80,000 people with access. The PRC's Internet population passed 2.1 million in 1998 before reaching 8.9 million at the end of 1999 and some 22.5 million at the end of 2000.[25]

China's first commercial deployment of Internet service occurred in May 1995, when the Beijing PTA, or Beijing Telecom, the capital's municipal telecommunications unit of the former MPT, introduced its own ChinaNET-branded service. Shanghai's municipal PTA launched service in June 1995 and PTAs in Guangdong, Liaoning, and Zhejiang began commercial Internet service in the second half of 1995. The first commercial service providers, then, fell clearly under the influence of the MPT's regional telephone companies.[26]

Not all of the country's service providers were local telephone companies. Accessing the Internet via bandwidth provided by the various major networks charted in Figure 1, other individual ISP companies, both collectively and privately owned, began to emerge from late 1995. All were at first required to obtain a license from network administrators, and many effectively operated as agents of ChinaNET. However, some ISPs did manage to develop a certain degree of independence. For example, InfoHighway was founded by entrepreneur Zhang Shuxin as the first private ISP in China and began service in September 1995. Zhang sought to model her company on nascent American integrated content and service providers such as Compuserve and targeted eight major cities for service provision. By the end of the year, there were some 20 companies, including the PTA providers, offering network connections to PRC residents. MPT-rival Jitong, at the time backed by the MEI and other ministries, launched its own ISP in September 1996, under the GBNet label.[27]

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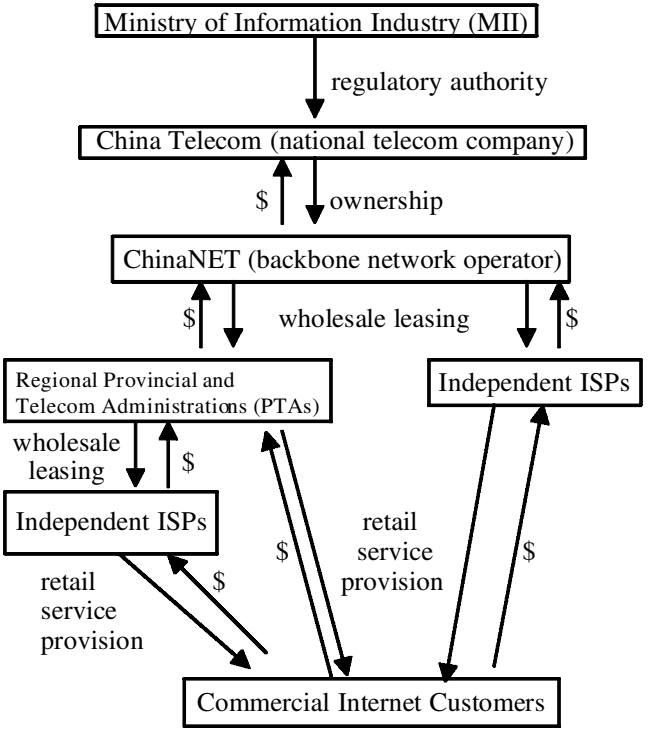
25. For 1994 and 1996: Tan, "Regulating China's Internet," p. 263. For 1998, see CNNIC, "Statistical Report of the Development of China Internet," Beijing, January 1999, at <http://www.cnnic.net.cn/Develst_e/English(9901).html/>. For 1999, see CNNIC, "SemiAnnual Survey Report on Internet Development in China," January 2000, at <http://www.cnnic.net.cn/Develst_e/cnnic2000_e.htm/>. For 2000, see CNNIC, "Semi-Annual Survey Report on Internet Development of China's Internet," January 2001, at <http://www.cnnic.net.cn/develst/e-cnnic200101.shtml/>. Interactive Audience Measurement Asia (IAMASIA), a Hong Kong-based survey organization, reported a lower figure of some 12 million users (defined as someone who has used the Internet within the past four weeks) in mid-2000, when the CNNIC found nearly 18 million users (with an unclear definition of "user", though the January 2001 survey defines a user as "Chinese citizens who use the Internet at least one hour per week."). We note that the official statistics are on the same order of magnitude. See the IAMASIA home page at <http://www.iamasia.com/>; and CNNIC, "Semi-Annual Survey Report on the Development of China's Internet," July 2000, at <http://www.cnnic.com.cn/develst/e_cnnic200007.shtml/>.

26. Duncan Clark, Alexandra Rehak, and Ted Dean, *The Internet in China* (Beijing: BDA China Ltd., 1999), p. 96.

27. Ibid., p. 97.

FIGURE 2 *Control Hierarchy and Revenue Flows of Internet Service Provision under the MII*



SOURCES: Authors' own compilation.
NOTES: The "$" sign indicates revenue flow. Similar wholesale arrangements with ISPs also exist for other backbone operators such as Netcom, although they fall outside of the MII purview. As of mid-2000, almost every commercial ISP used the ChinaNET backbone.

Some of the ISPs, such as ChinaNET/163 and NetChina in Beijing, were operated by or secured licenses from the local PTA and provided mainly coverage within limited localities. Others, including InfoHighway and China Online, secured inter-provincial licenses from the MPT and attempted aggressive cross-regional or nationwide expansion. China Online, for example, sought to offer dial-up service in 80 cities across the country. Figure 2 charts the organizational hierarchy of Internet service provision and revenue flows.

Many of the first ISPs, however, found themselves with excess capacity and thin profit margins. These early providers began by incurring immediate

losses as they spent heavily on buying or renting dial-up lines, leased lines, Internet bandwidth, servers, and software. Furthermore, hefty online fees, averaging 400 to 600 RMB per month (about $50–$75) for 40 hours, limited customer numbers. These costs were quite high even for citizens of more developed coastal provinces and cities such as those in Beijing, where per capita GDP stood at only some 14,000 RMB (about $1,700).[28] Private companies, such as InfoHighway, were particularly hard hit, as they lacked the deep pockets of the government-backed telecommunications companies. Of these early providers, then, the ISPs owned by or affiliated with the local governments' PTAs emerged as dominant players. By late 1997, ChinaNET/163 in Beijing had nearly 10,000 subscribers, and NetChina about 4,000. High MPT leasing fees were also major hurdles for InfoHighway and other new ISPs. In late 1996, the ministry, via ChinaNET, charged as much as $2 million for a 2 Megabits-per-second (Mbps) line; in the U.S., the equivalent rate would have been about $500,000.[29] Leased telephone lines from China Telecom, the MII's phone company, took up to 80% of the ISP costs in 1999, compared to about 6% for Internet providers in the U.S.[30]

In essence, the MPT was using its near-monopoly on consumer Internet service leasing rights to draw disproportionate revenues from retailing service providers. Regional government-owned service providers could afford to wait until the number of consumers grew and profits would begin; private companies had a more difficult time. Consider the national subscriber numbers for some of China's major ISPs as of late 1999. ChinaNET-affiliated providers, such as ChinaNET/163 and MultiMedia/169, had the largest number of users, at approximately 700,000 and 500,000, respectively. The PTA-backed Capital Online also had managed to attract a large number of customers (200,000). GBNet (100,000), China Online (50,000), and InfoHighway (50,000) trailed the companies more closely associated with the MII.[31] InfoHighway's founder, Zhang Shuxin herself left the company in 1998, though internal management disagreements seem to have been the major reason for her departure. By 1999, however, the company seemed to be doing well, with some 50,000 customers. It claimed $3 million in income for 1998, up from $1.2 million in 1997.[32]

28. Ibid., p. 155.

29. Paul Triolo and Peter Lovelock, "Up, Up, and Away—With Strings Attached," *China Business Review* (November–December 1996), p. 29.

30. Anthony Kuhn, "State Phone Monopoly Makes Using the Internet Difficult," *Los Angeles Times*, February 13, 1999, p. A2.

31. Author's own telephone interview survey with companies in Beijing 1999.

32. "China Infohighway in No Rush for Overseas Investment," China Online home page, July 15, 1999, <http://www.chinaonline.com/>.

In early 1999, a popular campaign led by academics against the high cost of Internet access and other communications caught the attention of Premier Zhu Rongji. Zhu and other central leaders addressed several of the early problems for Internet access on March 1 of that year, as they ordered sweeping cuts in leased line fees, fixed line connections charges, and Internet access rates.[33] These measures were meant both to help spread network access and to prevent the dominant MII and regional telephone company-controlled corporations from collecting excessive service fees. In the March moves, international leased line fees for ISPs were cut by some 65%, from $52,000 per month to $18,000. At the consumer end, the price of a second line for residential users fell from US$130–300 to under US$30. Internet hourly rates were lowered to RMB 4 per hour (about 48 cents), bringing typical monthly bills for customers to a more affordable US$15–$20.[34]

Unfortunately for many independent ISPs, however, the cuts in retail Internet rates they could charge Chinese consumers hit harder than any savings in lower leased line fees paid to use ChinaNET's backbone network. As a result, a number of independent ISPs gave up their quest for managing their own service and announced they would simply re-sell the service of the regionally branded ChinaNET Internet connections. As of late 2000, some 90% of ISPs had such a re-selling arrangement.[35]

Independent ISPs have struggled for a controlling stake in the physical data network structure, but the MII and its operating companies have been reluctant to allow them to collect large revenues for providing Internet access. The central telecommunications authorities and their regional carriers were able to ride out the high early costs of investing in equipment and paying leasing fees, and have become the survivors while network costs fall and the numbers of users skyrocket. Major cuts in leased line tariffs announced in December 2000 were coupled with a statement from the MII that it would no longer set recommended ISP retail rates. While the move offered renewed hope for independent ISPs, the dominance of ChinaNET-affiliated ISPs assured them the continued role of market maker. The only hope for independent ISPs may lie in cooperation with foreign corporations. If they can offer better service and learn to function more efficiently, they may stage a come-

33. "China's Internet Fees Expected to Decrease," *China Daily*, February 4, 1999, at <http://www.chinadaily.com.cn/cndydb/1999/02/d5-4net.b04.html/>; Wang Chuandong, "Ministry Unveils Fee Adjustments," ibid., March 1, 1999, at <http://www.chinadaily.com.cn/cndydb/1999/03/d1-1post.c01.html/>; Zhao Huanxin, "Internet Hook-up Cost Reduction to Enhance Extension Access," ibid., March 2, 1999, at <http://www.chinadaily.com.cn/cndydb/1999/03/d2-5inte.c02.html/>, and Clark, Rehak, and Dean, *The Internet in China*, p. 151.

34. Clark, Rehak, and Dean, *The Internet in China*, pp. 137, 151, 102.

35. BDA (China), Ltd., *Broadband Access in China: Focus Report* (Beijing: BDA (China) Ltd., 2000), p. 35.

back in the face of central and regional governmental challenges to service provision. We discuss the potential role in post-WTO China of foreign corporations in a later section. In the meantime, however, we note that the central and local governments have effectively used their greater financial resources and pricing structure to maintain control over the service part of the Internet's physical network.

Overall, the main priority of the MII and its operating companies seems to have been to retain as great a control as possible over the data network for two reasons. First, the information ministry sees great profits by selling access on both a wholesale and retail level. Second, it sees itself as a kind of government guardian for ownership control of the communications network and its content, in the same way as physical and editorial control of television and newspaper companies remain in other state hands. On the first point, recent moves to create competition, in the form of rapidly growing Netcom, may eventually weaken the MII's position and create benefits for consumers. Furthermore, if independent service providers can give better quality network access than the government-linked companies, we may see a reduced role for government agents in control of the network systems. On the second point, though outright ownership of the network infrastructure will probably remain in government hands for the time being, we must also consider the government's attitude toward network content. We turn to Internet content in the following section.

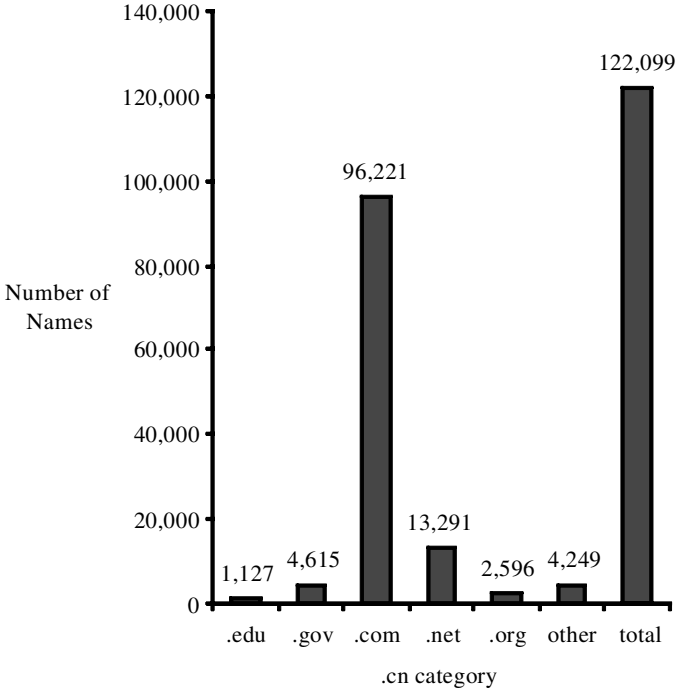
Internet Content: Regulation and Control of Domestic and Foreign Web Sites

Content for Chinese users grew slowly in the early 1990s but had greatly accelerated by the end of the decade. As Figure 3 shows, China has followed the pattern of other nations in corporate domain name registration, with nearly 80% of all registered names in early 2001 labeled ".com", while fewer than 1% belonged to the early academic domain, ".edu".

The number of registered domestic web sites derived from Internet Content Providers (ICPs) numbered about 265,000 in early 2001,[36] and, in contrast to most of the physical network ownership and management, many of the main content providers were private or cooperative companies. Popular sites currently include Netease (a.k.a. "163.com"), Sina.com, and Sohu.com. These sites provide mainly news, entertainment, and sports information but often rely on officially sanctioned agencies for their own content. Some, such as Sohu.com and Sina.com, have provided links to foreign news about China and Chinese-language sources published in various foreign countries but

36. CNNIC, "Semi-Annual Survey Report on Internet Development of China's Internet," January 2001, at <http://www.cnnic.net.cn/develst/e-cnnic200101.shtml/>.

FIGURE 3 *Numbers of Registered Domain Names by Category, 2000*



SOURCE: CNNIC, "Semi-Annual Survey Report on Internet Development of China's Internet," Beijing, January 2001, at <http://www.cnnic.net.cn/develst/e-cnnic200101.shtml/>.

since November 2000 have been required to link exclusively to state-approved news providers including Xinhua.

Control of Internet content, in contrast to the physical infrastructure, generally falls outside of the MII's purview. The ministry's August 1998 mission statement, for example, stresses its role in areas such as planning network construction and expansion, developing standards and coordinating production, and promoting "informatization" (*xinxihua*) of the economy.[37] Minister Wu Jichuan's own statements in public venues also tend to focus purely on matters related to telecommunications business regulation and strategies for developing the industry and maintaining competitiveness in a more open in-

37. Foster and Goodman, "The Diffusion of the Internet in China," pp. 124–26.

ternational environment.[38] We should not, however, take Wu's emphasis on economic issues as a sign of indifference on political content control. Wu more than likely agrees with political regulations on Internet content (discussed below), but as long as the activities of his own ministry remain relatively unaffected, he tends to avoid crossing into the realm of other parts of the government that focus on these issues.

It is the central State Council and top Communist Party propaganda organs that establish guidelines on what material is deemed sensitive. Though most rules were unpublished as of early 2000, draft laws included provisions that anyone seeking to operate "Internet and multimedia network services" had to apply for a license from authorities under the State Council.[39] In early October 2000, State Council decree 292 required ICPs to provide upon demand by authorities all content that appears on their sites as well as records of users who have visited their sites for up to 60 days prior to the request. ICPs were responsible for policing their own sites for "subversive materials."[40]

In contrast to Minister Wu's focus mainly on economic regulatory aspects of the Internet, Publicity Department chairman and Communist Party politburo member Ding Guan'gen has been the government's point man for keeping Internet content focused within allowable political boundaries. In early 2001, for example, he made several statements promoting the importance of official government information web sites such as Xinhuanet.com, and pledged that the government will "tighten control and delete 'harmful' material from Internet news reporting."[41]

Of course, the national government has long had restrictions on such activities as the spread of pornography, gambling, and publication of "counterrevolutionary" materials. In late 2000, Anhui became the first of China's provinces to set up an "Internet police force," but 20 other provinces and cities were also reportedly preparing such organizations.[42] Over the past few years, we have seen some examples of sanctions for those violating government content rules. For example, in January 1999, the public security bureau

38. For a recent lengthy speech by Wu on the growth of the information industry, see Guo Xiaohong, "Wu Jichuan buzhang zai kexue huitang fabiao zhuanti baogao" [Minister Wu Jichuan delivers a special report at the scientific auditorium], in *Renmin youdian* [People's posts and telecommunications], September 26, 1998, p. 1. See also Mark Landler, "Last Word in China's Phone Industry," *New York Times*, December 6, 2000.

39. "2dobiz.com Inside Track to Mainland China," *Business Wire, Inc*, September 28, 2000.

40. "China Issues Long-Awaited Internet Rules," Agence France Presse, October 3, 2000.

41. "Ding Calls for More 'Influential' Internet Development," *South China Morning Post*, February 9, 2001, available at <http://china.scmp.com/technology/ZZZV5PKVPGC.html/>.

42. "Chinese Internet Police," Xinhua News agency, August 4, 2000. In February 2001, the Ministry of Public Security released details of its own equivalent of "NetNanny" filtering software, named "110" after China's equivalent of "911." From April 2001 interview with a foreign telecommunications consultant, Beijing.

raided the offices of Sohu.com because users found links to pornographic sites.[43] Software engineer Lin Hai was arrested in March 1998 for sending some 30,000 e-mail addresses to an on-line, pro-democracy newsletter in the U.S. He was released in September 1999 but not before news of his crime and punishment spread rapidly through domestic chat groups and bulletin boards and served as a warning for those who would commit similar acts.[44]

In mid-2000, in one of the first high-profile cases of prosecution for Internet activities, an activist in Sichuan Province named Huang Qi was arrested for posting information on his web site, <http://www.6-4tianwang.com>, about victims of the 1989 Tiananmen demonstrations. In early March 2001, Huang went on trial for "subverting state power," a crime that carried a penalty of up to 10 years in prison. Huang's web site, however, was based outside China, so, as of mid-2001, the site continued to report on his trial as well as post information alleging police violence and abuse of Chinese citizens, and more general information on missing persons.[45]

The goal of these measures seems to be to intimidate users into censoring their own web content. As it is technically impossible for the Chinese government to screen all domestic web sites at all times, the tactic of "killing the chicken to scare the monkeys" (publicizing punishment to intimidate the masses) is one of the few tools the authorities can use to prevent ICPs from crossing politically acceptable boundaries. Some ICPs have admitted they actively check the content put on web pages. For example, InfoHighway's Zhang Shuxin stated in a 1996 interview that if the topics her audience addressed in discussion groups turned to be too political, "I cut them off."[46] As noted above, new rules place the burden on ICPs themselves for policing their web content.

Though many of the most popular domestic web sites are private, some regional government organizations try to attract viewers with useful material. Capital Online in Beijing is popular because of its free e-mail service, while the Shanghai city government recently launched Eastday.com to provide local news of the municipality. According to Shanghai city government officials, the site, launched in the summer of 2000, became the city's most popular one within two months.[47] At it, Shanghai audiences can view news from several of the city's main newspapers and television stations.

43. Bruce Einhorn and Dexter Roberts, "China's Web Masters," *Business Week* (international edition), August 2, 1999, at <http://www.businessweek.com/datedtoc/1999/9931.htm/>.

44. Kevin Platt, "After Prison, Dreams of China's Democracy," *Christian Science Monitor*, March 21, 2000, p. 7.

45. "Web Renegade on Trial," *Asiaweek*, March 2, 2001, p. 14.

46. Keith B. Richburg, "A Great Wall of China Slowly Gives Way; Entrepreneur Creates On-line Network Despite Official Controls," *Washington Post*, April 8, 1996, p. A01.

47. Interview with Shanghai academic researcher, by Harwit, Shanghai, July 19, 2000.

It is unclear how well these state-owned enterprises will fare in competition with the private, mainly Beijing-based, corporations. However, private content companies face problems similar to those of American and other foreign content providers: how can they generate profits without directly charging viewing customers? One of the main revenue generators, on-line advertising, brought only US$3 million to all Chinese ICPs in 1998 and some US$10 million in 1999.[48] One 1999 survey in Beijing found only three of 67 Internet companies were profitable.[49] Many of the private ICPs faced looming debts in late 2000 and sought new infusions of foreign venture capital. In contrast, municipally owned web sites could feel secure with the financial backing of the city government to support them over the longer term. However, as Table 2 indicates, none of the state-backed web sites ranked in the top 10 most popular web pages in mid-2000.

In the same way that domestic government-backed ISPs weathered early financial squeezes in the late 1990s, the domestic ICPs with government backing could also emerge as survivors in the competition for viewing audiences. Furthermore, the government web sites will generally be resistant to posting material that violates the country's content rules and will therefore be viewed more favorably by policing organs. Of course, if state-backed content providers fail to include information that meets viewers' needs, the private content providers can win out by satisfying broader consumer demands.

Though the number of domestic ICPs has grown quickly over the past few years, a large portion of the web content for Chinese readers comes from overseas sources. Some of the first foreign web sites to target Chinese audiences came in the wake of Beijing's Tiananmen Square demonstrations of 1989. Overseas Chinese scholars founded China News Digest to spread news of the PRC derived from mainly Western news wire services. Readers could subscribe through e-mail accounts and receive daily briefings that could be displayed in Chinese language if users had proper software.

As ICPs saw a great expansion in the U.S. in the mid-1990s, Chinese also turned to foreign content for information and entertainment. Yahoo!'s English-language page became the most popular site in China for a time, as it provided a useful portal to the main American web pages. In May 1998, Yahoo! itself launched a Chinese-language site. Domestic web sites, however, dominate lists of the most popular web sites in China, as Table 2 shows. Only three foreign web sites—those of Yahoo!, Microsoft, and the Hong Kong-based China.com—made the list. Still, the table indicates users do have broad access to the kind of information useful for understanding a broad

48. "Content Licensing Ducks China's Media Blockade," *Sydney Morning Herald*, July 25, 2000, p. 33.

49. "For Most China Internet Companies, Profitability Means Improbability," ChinaOnline LLC online news service, July 19, 2000, at <http://www.chinaonline.com/>.

TABLE 2 *Top Ten Web Domain Sites for All Users, February 2001*

Rank	*Domain*	*Unique Visitors (in millions)*
1	sina.com.cn	4.6
2	sohu.com	4.5
3	163.com (Netease)	4.0
4	chinaren.com	3.0
5	yahoo.com	2.3
6	microsoft.com	2.1
7	etang.com	2.0
8	163.net	1.9
9	263.net	1.6
10	china.com	1.3

SOURCE: IAMASIA corporate survey, at <http://www.iamasia.com/>.
NOTE: The survey is of 6,000 residential users, taken via data collection software on users' computers, across several major Chinese cities, February 2001.

range of economic, scientific, and cultural topics from a wide variety of sources.

Central government control of access to foreign web pages remains schizophrenic, as the goal of exploiting the international network's educational and commercial advantages conflicts with the desire for information monitoring. Since the mid-1990s, the Chinese government has made several attempts to regulate access to some sites by targeting specific website Internet protocol numerical addresses. In particular, officials have tried to block Western news sources sometimes critical of China, such as the *New York Times*, the *Washington Post*, and *Time* magazine. Following rules similar to those for controlling domestic ICPs, other targets for control attempts have been pornographic sites, web pages printing or even broadcasting anti-government propaganda, and gambling sites.

In a 1996 move to intimidate users, the government required ISP customers to register with the police when they open an account. Recently, more sophisticated efforts have been made to selectively block access to foreign sites through dynamic blocking enforced at the level of the interconnecting network, rather than at the service provider. This method is a response to criticism over the earlier slow access speeds resulting in part from the heavy handed-attempt to block permanently a large number of foreign web sites.[50]

50. Telephone interview with foreign business consultant operating in Beijing, by Harwit, October 2000.

Many of the attempts to control access to foreign sites have failed. Table 2 clearly indicates that many millions of viewers have access to sites such as Yahoo! and Microsoft, though these have what the government would probably consider useful though policy neutral content. Government regulations are also unevenly enforced. For example, while *Time*/CNN web sites are sometimes blocked, *Newsweek* and ABC News sites are usually open. Rules announced in January 2000 that would have required web companies—domestic and foreign—that used encryption software to register each individual user were quickly withdrawn after American companies argued they were too restrictive.[51] Furthermore, the 1996 requirement to register with the police in fact is a passive regulatory tool and has more psychological than practical effect on user habits.

As for skirting blocked foreign web pages, several companies outside of China, such as rewebber.de, now offer free "anonymous" web surfing services. The user accesses the free site, then enters a new address on the site's internal window, and connects to the new, perhaps controversial, page. The Chinese server therefore does not have a chance to block access, as it believes the user is still accessing the free anonymous web page. As of late 2000, the government had not yet blocked the anonymous server sites, which would effectively stop this practice. Furthermore, as Lynch pointed out, "objectionable" foreign web sites, such as those supplying pornography or anti-government materials, can change web addresses or proliferate to such a degree that the government cannot keep track of them.[52] Evidence of such use comes from one European survey firm, which found that some 60% of web hits by users monitored in Beijing in 1999 were adult-oriented sites.[53] In sum, the high degree of government control over foreign web access foreseen by Mueller and Tan has yet to materialize and, according to one foreign technician who has close ties to the MII, there is actually no intention to develop or deploy omniscient monitoring tools.[54]

Of course, the Internet is not the only tool Chinese citizens have for receiving uncensored foreign information. China now has more than 200 million telephones, tens of millions of fax machines, and, in some years, as many as 30 million illegal satellite dishes.[55] These tools of communication are available to a broad segment of Chinese society and, in the short run, are probably

51. M. K. Shanker, "Security Software Creators Find Openings as Curbs Ease," *South China Morning Post*, March 21, 2000, Technology Post section, p. 4.

52. Lynch, "Dilemmas of 'Thought Work'," pp. 196–97.

53. Interview with researcher at foreign survey firm, by Harwit, Beijing, June 2000. The company placed software on Internet users' computers, and provided them a small stipend and a guarantee on anonymity for their cooperation with the survey project.

54. Interview with foreign consultant, by Harwit, Beijing, June 12, 2000.

55. Chan, "Media Internationalization in China," p. 73.

the more likely means of communicating with disaffected members of Chinese society, at least in the near term, than is the Internet. Be that as it may, we do see some tangible evidence of foreign web sites affecting domestic Chinese social behavior. In early 1999, for example, members of the Falun Gong spiritual exercise group led by a Chinese individual in exile in the U.S. staged demonstrations in China that were reportedly coordinated via an American-based Chinese language web page. Such activity shows the potential power of sites located outside of Chinese government jurisdiction, and indicates regulation of domestic portals is somewhat of a moot point.

Though the domestic ICPs practice some self-censorship in their content, they have so far been allowed some financial cooperation with foreign sources. Sina.com, for example, is backed by Goldman Sachs, Softbank, Pacific Century Cyberworks, and Dell, among others, while Zhaodaole.com was supported by a Malaysian conglomerate. However, Netease.com's $65 million initial public offering in June 2000 on the U.S. stock exchange Nasdaq shows some limits to foreign financial access to China's ICPs. The stock offering was allowed to proceed only on condition that actual ownership of the domestic Chinese company was taken out of the listed enterprise. The domestic enterprise was created to operate the ICP, and this company entered into a service contract with a wholly owned subsidiary of the foreign entity (a Cayman Islands company) that listed on the Nasdaq.[56]

Part of the MII strategy in allowing limited foreign investment in ICPs may reflect earlier trends in similar media content. As Joseph Chan documents, the government was keen to allow restricted joint ventures in television program production so that domestic producers could both absorb needed capital, as well as learn foreign technique. He described a significant audience shift in southern China away from Hong Kong radio content and toward local production after stations actively emulated Hong Kong presentation styles using regional content.[57]

In sum, the MII may be allowing foreign capital in during the nascent growth of ICPs but maintains some restrictions on how foreign investors can influence content provider management. The Chinese government could potentially even try to force out foreign corporations when the domestic companies reach greater economic viability. China's entry to the WTO, discussed later in this essay, speculates on future foreign investment opportunities. Unlike the builders and managers of the physical Internet infrastructure, the early pioneers of Chinese web content are mainly private, non-governmental organizations. Foreign companies have greater access to providing content

56. Prospectus for Issue of American Depository Shares of Netease.com, Inc., June 29, 2000, title page, p. 21.

57. Chan, "Media Internationalization in China," pp. 79, 76.

through their foreign web sites and even have some limited ability to invest in domestic web companies. The government continues to maintain some control over the most sensitive of network content through a combination of rules and public examples to inspire self-censorship among Chinese domestic ICPs. It also employs limited blocking techniques to try to prevent the most controversial foreign materials from reaching Chinese audiences. The phenomenon of municipal government web pages attracting large audiences and perhaps stealing viewers from struggling private corporations could, however, mark a movement toward greater government control over network content.

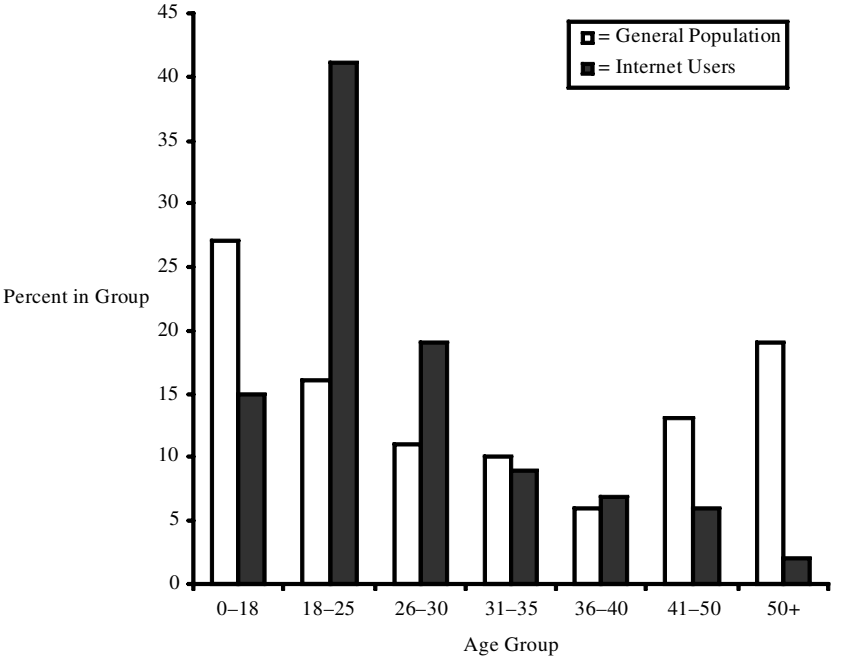
Before examining factors that will shape the control of China's Internet use into the future, we focus on ways current demographics of Internet users affect both web page content, as well as possible social implications of network viewing. The profile of current Internet audiences in China helps us understand not only what material viewers will demand, but also allows us to apply larger sociological and political theories about how network users' world views will develop in the early years of the coming decade. As we will see, these world views in turn represent a feedback mechanism, one that determines the degree of social and political control that the Chinese government organs will seek to exercise.

Internet User Profiles and Social Implications

Striking features of Chinese user profiles include the predominance of youth and male users of the data network system. Figures 4 and 5 and Table 3 indicate demographic patterns as of late 1999 and early 2000. As a whole, users tend to be young men of college age. Older citizens represent a far smaller percentage of the network community than their proportion in the population would indicate. These characteristics reflect similar patterns to those seen in early use of the Internet in the U.S. as well as Europe. As Figures 4 and 5 indicate, though, women's usage has begun to grow over the past two years and will likely soon begin to reflect patterns now seen in Western countries, where age and gender features now more closely mirror that of the larger population.

Table 3 compares the percentage of respondents to a nation-wide survey with their respective percentages of the country's population. Geographically, we see wealthy coastal areas with a higher proportion of users than their overall populations would warrant. Cities such as Beijing and Shanghai had user survey response several times that of the proportional populations, while poorer provinces such as Yunnan, Guizhou, and Tibet were underrepresented in the survey. However, such regional deviation may be amelio-

FIGURE 4 *Internet Use by Age, 2000*



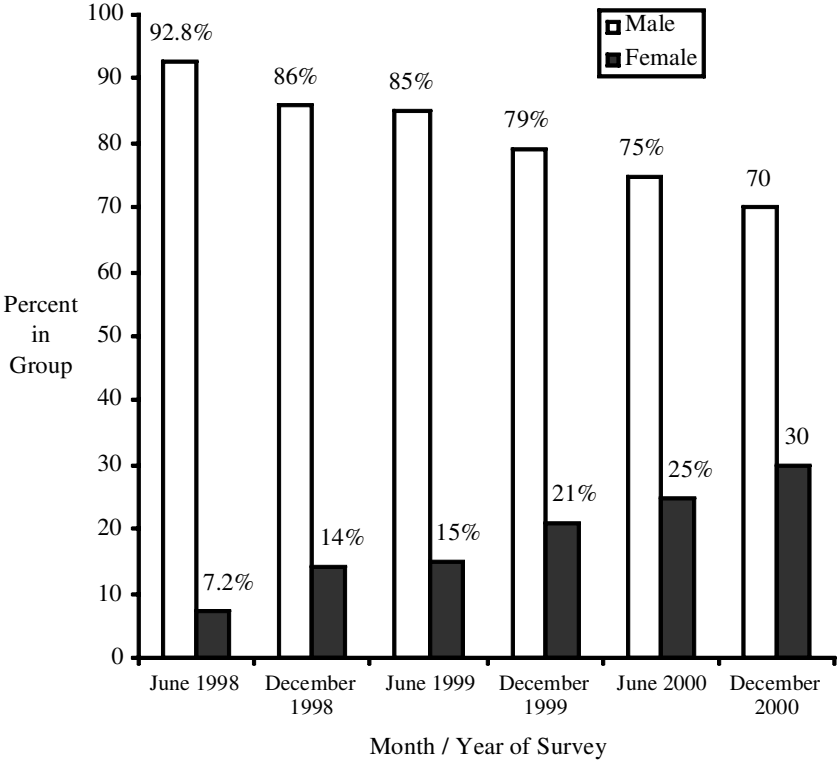
SOURCES: For Internet users, see CNNIC, "Semi-Annual Survey Report on the Development of China's Internet," Beijing, July 2000, at <http://www.cnnic.com.cn/develst/e_cnnic20007.shtml/>.

rated as government measures and the Internet itself contribute to broader economic growth in China's inland regions.

Overall, according to the data, the typical Internet user in China is currently a 20–30-year-old male living in either an urban area or a relatively wealthy province such as Guangdong. Noting that in the 1980s young college-age students were among the leaders of several democracy campaigns that culminated in the 1989 Tiananmen Square movement, we wonder, could or will this age cohort use new network tools for social activism purposes? In answering this question, we consider ways that Chinese use the Internet and compare them to the findings of Nie and Erbring. Table 4 compares American and Chinese activities using web accounts.

We see that Chinese patterns of use are similar to those in the U.S. and indicate utilization of the network for informational, educational, as well as entertainment purposes. There are some exceptions, such as travel informa-

FIGURE 5 *Changing Internet Use by Gender, 1998–2000*



SOURCES: CNNIC, "Statistical Report of the Development of the Chinese Internet," July 1998, at <http://www.cnnic.net.cn/Develst_e/English(9807).html/>, and "Statistical Report of the Development of China's Internet," January 1999, at <http://www.cnnic.net.cn/Develst_e/English(9901).html/>; "Semi-Annual Survey Report on the Internet Development in China," July 1999, at <http:/www.cnnic.net.cn/Develst_e/1999-7/1999-7.htm/>; "Semi-Annual Survey Report on Internet Development in China," January 2000, at <http://www.cnnic.net.cn/Develst_e/cnnic2000_e.htm/>; "Semi-Annual Survey Report on the Development of China's Internet," July 2000, at <http://www.cnnic.com.cn/develst/e_cnnic200007.shtml/>; and "Semi-Annual Survey Report on Internet Development on China's Internet," January 2001, at <http://www.cnnic.net.cn/develst/e-cnnic200101.shtml/>.

tion and on-line purchase, that reflect different levels of disposable income in each society. Furthermore, Nie and Erbring's study found social isolation increasing when Internet use was greater than 10 hours per week—in their study some 15% of American users spent that long per week. But some 53% of Chinese users reported spending more than 10 hours per week using the

TABLE 3 *Internet Use by Selected Geographic Location, 2000*

Province or Municipality	*Percentage of Survey Respondents by Region*	*Region's Population as Percentage of National Total*	*Ratio of Respondents to Population Percentage*
Beijing	12.39	1.00	12.39
Shanghai	8.97	1.18	7.60
Tianjin	2.53	0.77	3.29
Guangdong	9.69	5.70	1.70
Liaoning	4.66	3.33	1.40
Heilongjiang	2.46	3.03	0.81
Qinghai	0.31	0.40	0.78
Hunan	3.97	5.23	0.76
Hubei	3.52	4.75	0.74
Sichuan	5.03	6.82	0.74
Anhui	2.43	4.96	0.49
Hebei	2.47	5.28	0.47
Yunnan	1.46	3.31	0.44
Guizhou	0.80	2.92	0.27
Tibet	0.03	0.20	0.15

SOURCES: For survey respondents' figures, see CNNIC, "Semi-Annual Survey Report on Internet Development of China's Internet," Beijing, January 2001, at <http://www.cnnic.net.cn/develst/e-cnnic200101.shtml/>. For population figures, see *China Statistical Yearbook, 1998* (Beijing: China Statistical Publishing House, 1998), p. 107.
NOTE: These numbers refer to the percentage of respondents to an on-line survey, grouped by region of respondent. The CNNIC received a total of some 26,667 valid responses to its survey. Sichuan Province does not include Chongqing municipality.

TABLE 4 *Comparison of Selected Activities of American and Chinese Internet Use Patterns*

Activity	*American User*	*Chinese User*
E-mail	90	88
General information	77	N.A.
Search engine	N.A.	56
Downloading and uploading	N.A.	51
Entertainment	36	18
Travel information	54	19
Buying/online purchase	36	14
Job search	26	26
Chat rooms	24	39
Trading stocks	7	15
Matchmaking	N.A.	12

SOURCES: Norman Nie and Lutz Erbring, *Internet and Society: A Preliminary Report* (Stanford, Calif.: Stanford Institute for the Quantitative Study of Society, February 17, 2000), p. 9; and CNNIC, "Semi-Annual Survey Report on the Development of China's Internet," Beijing, July 2000, at <http://www.cnnic.com.cn/develst/e_cnnic200007.shtml/>.
NOTE: Not all categories were solicited in each survey; N.A. indicates information is not available.

network.[58] Surveys of Chinese users do not exactly replicate Nie and Erbring's queries on whether they spend less time with family and friends, but the long hours spent in front of screens indicate some similarity to American user patterns.

Should China follow the American trend outlined by Nie and Erbring, then, the likelihood of greater "civil society" autonomous group formation in the PRC might actually be diminished. Rather than organizing movements that might fall outside of political control, Chinese citizens could end up more isolated, and less likely to challenge rule by established authorities. Of course, the communication outlets for Internet users also can work against this isolation trend. Chat groups in China (as well as the U.S. and other countries of the world) allow virtually unrestricted opportunity for communication among like-minded individuals. For Chinese, such an outlet for discussion offers a potentially powerful medium for anonymous expression of a wide variety of opinion and thought.

In practice, however, many current chat groups often contain rather bland discussion. Online browsing conducted by the authors found that one of the most popular sites in China, Sina.com, for example, mirrors many other content providers by including such chat rooms as "sports," "living," "travel," "games," "food," as well as match-making areas and others, and has attracted up to 13,000 users at a time. However, repeated random visits to the chat rooms found that visitors seldom adhered to the category guidelines. In fact, the "chat" tended to be quite repetitious, with many users simply extending greetings to others in the room, making some references to their social lives, or complaining about how slow their connections or computers were. There was little discussion of politics or current events. None of the more widely known web sites in Chinese, including Sina, have a chat room labeled "politics," though China.com has had an area for discussing general "news."

There are exceptions to these observations. In the wake of the October 2000 rules on ISP monitoring, some chat room visitors posted critical comments. "Totally nuts!" said one posting on Sina.com on October 3, adding: "Could anybody pass my question to the people who made the new regulation on the Internet? Do these people know how the Internet works? If China requires a licence, shall we move overseas?" Another on October 9 said: "The domestic ICPs are doomed."[59] Part of the problem for users of these chat rooms has been the slow speed of modem connection. Replies made with slow-response computers are delayed so much that the train of

58. CNNIC, "Semi-Annual Survey Report on the Development of China's Internet," July 2000, at <http://www.cnnic.com.cn/develst/e_cnnic200007.shtml/>.

59. Duncan Clark, "Decree Clearly Adds to Confusion," from "Beijing Byte" e-mail information service, posted October 16, 2000, from <http://www.bdaconnect.com/>. However, we do not know whether those who posted these comments actually reside in China.

conversation is difficult to maintain. Even as connection speeds improve, the types of police monitoring noted above probably also inspire a kind of self-censorship among many chat-room users.

These and less widely used chat rooms do, however, occasionally contain bursts of frustration with China's political system, and sometimes heated discussion of contentious issues. The bombing of the Chinese embassy in Yugoslavia in 1999, for example, unleashed various political debates on several web sites, as did the April 2001 incident involving the collison between an American military plane and a Chinese fighter and the subsequent landing of the former on China's Hainan Island. However, attempts by Western scholars to quantify such content and categorize it as "political dialogue," "anti-government sentiment," or some other type is complicated in many instances by the difficulty in determining whether the chat room participant actually lives in China and is thereby subject to security bureau retaliation or whether the person is based in the U.S., Taiwan, or some other country.

Chinese chat groups do, on occasion, have some influence on Chinese government officials and policy. For example, Premier Zhu Rongji apparently took a more conservative stance toward improving ties with Japan during an October 2000 visit to Tokyo when chat groups expressed some hostility toward his seemingly conciliatory views.[60] In March 2001, Zhu made a televised apology to the nation after a school explosion; his action followed fierce chat room criticism of the government investigation of the incident.[61]

The more controversial communications to and within China on the Internet are probably done through conventional e-mail. These forms of dialogue are more difficult for police to monitor. Currently, we have no data on how many e-mail messages are of a socially disruptive nature. However, to protect against police infiltration of e-mail groups, sensitive communication is likely limited to a few users at a time. In this way, e-mail loses some of its ability to affect large numbers of citizens and may then be relegated to the same kind of one-to-one communication now available through telephone, fax, or even postal letter contact.

The demography of Internet users also has implications for the types of potential political challenge we might expect in the near term. For example, many of the members of the Falun Gong are reportedly older citizens, ones who may turn to the group's exercises for health reasons. We would expect, then, that relatively few members of the Falun Gong are active Internet users.

60. Informal discussion by Harwit with Chinese central government official, April 2001, Beijing. This official commented that others in the official's ministry use chat sentiment as a kind of unofficial public opinion poll. Of course, as noted above, such official attention to chat groups leaves them open to manipulation by overseas Chinese seeking to distort chat discussion content.

61. Andrew Browne, "China's Zhu Apologizes over Deadly School Blast," Reuters World Report, March 15, 2001.

Reports that the Falun Gong communicates with it members through the Internet may in fact reflect network use mainly among the group's leaders. Directives to the group's members would more likely be spread through more traditional methods of communication, such as through the telephone or word of mouth.

For many of the young, mainly urban, male users, there may be little incentive to endanger their future careers by discussing politics. As social scientists such as Andrew Walder and Margaret Pearson have found, those members of Chinese society who see a secure career path within the existing political system may be reluctant to disrupt it.[62] The potential danger of random government checks of these chat groups may suffice to institute self-censorship among current Internet users. Futhermore, if Internet content creates the same kind of consensus building that Chan saw with television content, stability may be further reinforced.

In sum, the avenues for greater political dialogue are expanding, and as the number and demographics of users change in the coming years, the kinds of discussion will undoubtedly evolve. At the moment, however, there is little indication that Internet forums are contributing to a greater degree of Chinese civil society. The kind of future challenge seen by Taubman and others who forecast net-based autonomous group formation, and perhaps eventually democracy, has yet to materialize.[63]

The lack of an immediate political challenge, then, influences the methods the government will employ to control both the Internet's physical infrastructure, as well as its network content. If user demographics indicate that a challenge to the ruling authority may be muted, the need for control will also be softened. As access to data network tools spreads to less-privileged members of society in coming years, though, we may expect new voices could change at least some of the current tone of network content.

The WTO and the Future Role of Foreign Corporations

As seen above, foreign web content is already widely available to Chinese audiences, and foreign companies have even been able to take limited financial stakes in Chinese ICPs. How will China's expected entry to the WTO affect future roles of foreign companies? According to the most recent conditions for the PRC's entry to the world trade body, the country would open up to 49% ownership in China's ISP companies, and as much as 50% in other

62. Andrew Walder, *Communist Neo-Traditionalism* (Berkeley: University of California Press, 1986); and Pearson, *China's New Business Elite*. Pearson examined private business people and joint venture employees in the early 1990s to reach these conclusions.

63. Taubman, "A Not-So World Wide Web," pp. 255–72.

services such as e-mail and on-line information. These steps could allow some significant foreign influence over how Chinese consumers get access to the network, as foreign companies could aid nascent private ISPs in their drive to take market share from regional network companies. The influence of municipal and provincial companies in controlling revenue flows could effectively be curtailed. Private ICPs, in a similar way, could benefit from foreign capital and expertise and ensure that state-backed content companies faced continued competition.

Increased economic strength could embolden Chinese service and content providers to exert greater creativity and perhaps reduce their willingness to follow Chinese government rules and restrictions. Of course, punishment by police for violation of government rules would still deter even the strongest companies from challenging political edicts, but the government would lose some control now held in its economic levers. Increases in wholesale leasing fees, for example, could have less effect on foreign-backed ISPs, and cash-burning ICPs could last longer against deep-pocketed municipal and regional government web sites. In late 1999, however, the State Council was considering a law restricting such Sino-foreign joint ventures to state-controlled enterprises, and the October 2000 regulations noted earlier indicated such companies would be favored for foreign investment. Furthermore, if foreign companies themselves choose to partner with the state corporations, the private companies would face an even greater challenge for control of service and content.

Conclusion

In conclusion, we see that government control of the physical network does not necessarily imply control over content. The MII may have both direct and indirect dominance over the data pipelines, but the ministry's main goal seems to be collecting revenue from those who use the system. As long as the MII can accomplish this goal, it tends to shy away from conflict with the party organs and publicity offices more fully charged with regulating Internet content. Conservative members of the government leadership probably also believe that the actual tools of communication should remain in state hands for the same reasons that there are no private newspaper printing presses or television transmitting stations.

On the other hand, much of China's Internet content is in private hands. Self-censorship probably is a big factor in controlling the political nature of this content, but the composition of the audience also shapes what is put on Chinese screens. We see, though, that those few who violate unspoken government limits of expression, if detected, face severe sanctions.

Nascent government-backed web sites, such as Eastday.com in Shanghai and others, stand also to be a potential challenge to the free market forces

working among the private dot.com content companies and service providers. The utilization of superior financial resources by the government sites stand to contradict the government's goal of taking state enterprise out of the economy's forefront, and encouraging the growth of private businesses. In the wake of the (perhaps temporary) global weakness among Internet content providers, national and local government moves in China to develop state-owned web enterprises could retard free market forces, at least in the short term.

Finally, with the possible exception of the Falun Gong demonstrations, access to foreign information via the Internet has had little socially disruptive impact in the short term. Internet demographics indicate that user profiles in fact work toward social stability, at least in the coming few years. Younger users may avoid controversy, and use the network more for education and entertainment purposes.

A key turning point may come if foreign companies are allowed full ownership of web content providers or service providers, though even here police restrictions could thwart a free flow of information. Furthermore, as today's elite Internet users age and perhaps come to encounter financial or political difficulties in their lives, and as more disaffected members of society find access to the network, we may see it emerge as a tool utilized more often for channeling discontent.

In short, the government seems intent on tapping the most lucrative parts of the Internet—here is where we see the greatest desire for control. As for content, in the short run, political controls will remain schizophrenic as the value of an open network conflicts with conservative political philosophies and as the nature of the Internet's audience makes it an unlikely tool for precipitating socially disruptive forces.