MOBILE DATA COMMUNICATIONS IN CHINA

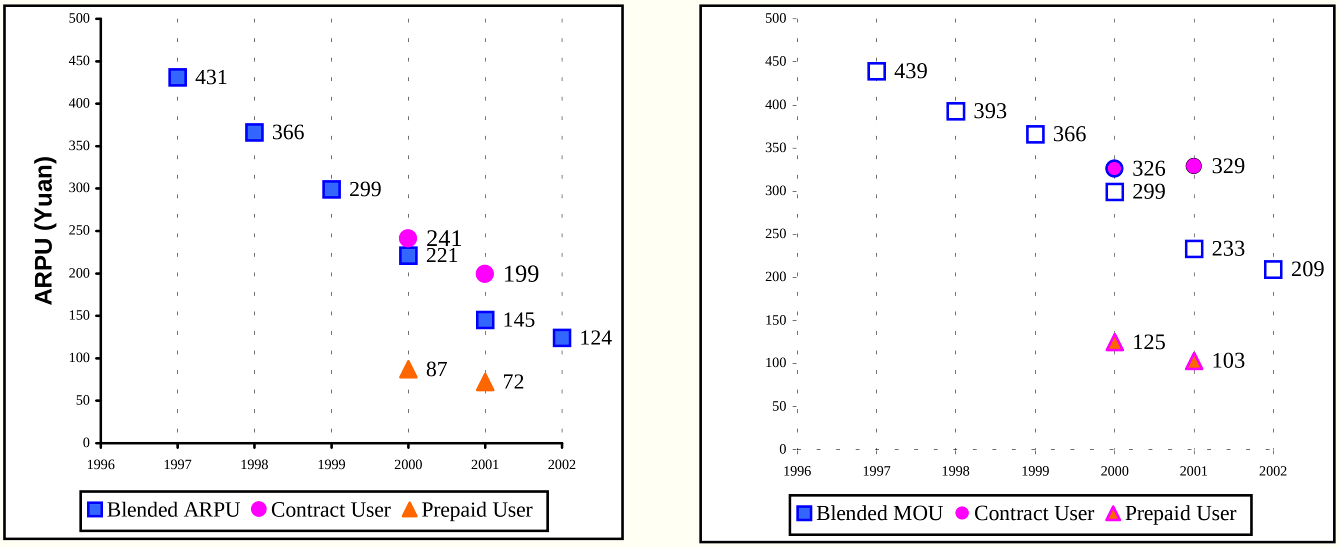
Xu Yan

Department of Information and Systems Management
Hong Kong University of Science and Technology
Clearwater Bay, Kowloon
Hong Kong

Tel: (852) 2358 7640
Fax: (852) 2358 2421
E-mail: **xuyan@ust.hk**

The Chinese mobile communications market has enjoyed impressive growth in last decade in terms of the number of subscribers. By July 2002, the total number of subscribers has reached 180 million, which turned China into the largest mobile communications market in the world. However, it must be noted that subscribers do not necessarily equate to users. Figure 1 shows the decline of Average Revenue Per User (ARPU) per month and Minutes of Usage (MOU) per user per month of China Mobile (HK) over the past 6 years. The ARPU was 221 Yuan (US$26.69) in 2000, representing a decline of 26.1% compared with 1999. The MOU in 2000 was 299 minutes, a decline of 18.1% compared with 1999. In 2001, the ARPU and MOU have further declined to 145 Yuan (US$17.51) and 233 minutes. This trend has continued in the first half of 2002. According to China Mobile, the decline in ARPU and MOU was mainly due to the substantial growth in lower usage subscribers, and, in particular, subscribers of pre-paid services.

Figure 1. Changes in ARPU and MOU of China Mobile (HK)
Source: Annual Reports of China Mobile (HK)



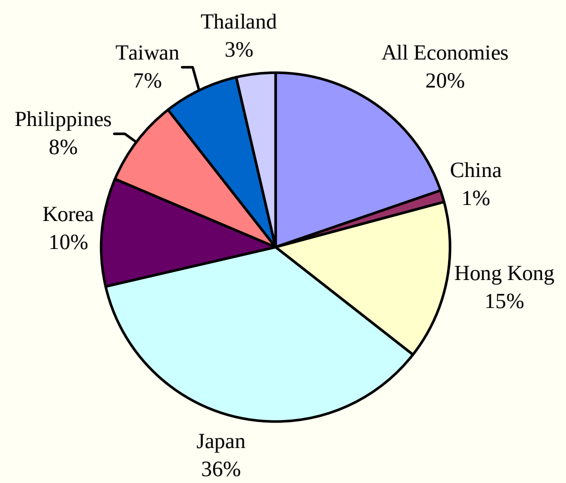
Note: ARPU = Average Revenue Per User, per month; MOU = Minutes of Usage, per user, per month
Data for 2002 is by June 2002

Mobile Value Added Services in China

In order to fully explore the potential of the network resource and to generate more revenues from current subscribers, both China Mobile and China Unicom – the two operators in the current duopoly Chinese mobile communications market - have introduced a variety of value added services in past years. These services include caller number display, voice mail, short messages, call forwarding, call waiting, conference calls, long distance Internet Protocol (IP) telephony, etc. In an effort to keep up with mobile commerce developments world-wide, both China Mobile and China Unicom formally launched their nation-wide WAP (Wireless Application Protocol) service on World Telecommunication Day, namely May 17th, of 2000. Services now available through WAP include mobile banking, stock trading, news, weather report and e-mail.

However, WAP services have not found much success with subscribers. In Beijing, China Mobile only managed to sign up 8,000 WAP users five months after the service was first launched [1]. A survey during the period from December 2000 to February 2001 revealed that only 2% of Chinese subscribers access mobile Internet via WAP phones, the lowest among all eight Asia-Pacific economies studied (Figure 2).

Figure 2 Mobile Internet Access using WAP or i-mode Phones
Source: http://www.tnsofres.com/apmcommerce



In contrast, subscribers of the famous i-mode service of NTT DoCoMo in Japan have increased at an average rate of around 668,700 per month since the service was launched on 22 February 1999. In fact, in May 2000, the operator had to temporarily suspend the sign-up of new subscribers because demand surpassed system capacity. By July 2002, the total number of i-mode subscribers had reached 34.1 million [2].

The inconsistent response from the market might result from inherent differences in the technologies upon which WAP and i-mode are based.

Firstly, WAP uses Wireless Mark-up Language (WML) for programming content. This implies that content providers have to first learn this language before they are able to provide content for the operators. This means that they would need to recuperate this cost through user access charges. As a result, the availability of content is limited. In the case of i-mode, compact HTML (CHTML), a subset of HTML 3.0 for Internet content, is used for programming. This practically eliminates the switching cost for content providers wishing to make their services available on i-mode.

Secondly, WAP currently runs over circuit-switched networks with low transmission speeds and per-minute charging. Users are billed according to the time that they spend online or occupy the circuit, whereas in the case of i-mode, a packet switching system, PDC-P, is used, which is fast for transmission and the user pays for each packet of data, rather than the time online. Currently, one packet of 128 bytes of data is charged at a rate of 0.3 Yen, or approximately 0.3 US cent, which is 80% cheaper than the circuit switching system for the same volume of content.

Thirdly, for information access via WAP, the user is obliged to key in a username, password, and has to dial several digit of numbers. On average, it takes 30 seconds to get connected to the network. For i-mode, packet switching places the handset in an 'always-on' mode, which means the i-mode handset is always on 'stand by', ready to receive data, thereby providing increased convenience to users.

In addition to the technical strengths outlined above, NTT DoCoMo has also created a successful business model. It provides a platform upon which content providers supply the content, either for free or for a small premium fee, which is set at a maximum of 300 Yen per month. NTT DoCoMo shares traffic revenue related to content with the providers of the content, and typically keeps a 9 per cent commission fee. This has provided a strong incentive for content providers. As a result, a large amount of Japanese content is now available. In April 2000, for example, 448 application alliance partner companies and 8,023 voluntary i-mode Internet websites, including 20 search engines, have content provision contracts with NTT DoCoMo. The availability of all of this content has attracted more and more subscribers. As more subscribers sign up for i-mode, more content providers are enticed to provide more content. A positive feedback process is thus established [3].

The Monternet

NTT DoCoMo's success in Japan has provided Chinese cellular operators with valuable experience. In November 2000, China Mobile introduced the Monternet program. Under this program, service providers can access the carrier's mobile network at any place to provide nation-wide service. This is also known as the "one-stop shop, China-wide service" arrangement. China Mobile keeps 9% of the traffic revenues while the information service providers receive 91% of the revenue. If the arrangement is to include coverage for bad debts, China Mobile increases its commission to 15%.

The Monternet program has generated an overwhelming response from service providers. By the end of March 2001, 102 service providers had joined the Monternet program for co-operation in the mobile Internet market [4]. As there are so many content providers, China Mobile has to implement "cherry-picking" in order to supply its limited capacities to the most valuable content providers. These service providers include Sohu, Sina and other popular Internet portals. None of these companies have yet made any profit through their wireline Internet businesses, but Monternet has opened up new possibilities, with subscribers paying for every message they receive. In the world of mobile Internet, there is no such thing as a "free lunch".

Currently, these service providers offer several types of services, including message-on-demand, message broadcasting, banking, stock-trading, etc. For example, subscribers can visit the website of Sohu and subscribe to customised news, such as sports and entertainment. This allows them to receive the latest news via their handsets on a regular basis. At this time, China Mobile charges 0.2 Yuan (US$0.024) for each item of news. For information ordered by the handset, China mobile will charge 0.1 Yuan (US$0.012) for the requesting message and a different rate for terminating the message (see Table 1 for an overview of charges). In addition to the transmission fee, content providers may also charge a content fee, and the rate varies depending on the individual service provider. For instance, NewPalm delivers daily weather reports to a subscriber's handset for a total monthly fee of four Yuan (US$0.48). China Mobile collects this content fee on behalf of the content providers, and also shares the transmission fee with them.

Table 1: Termination rate for messages of different content (per item, Yuan)

Stock	0.20	Train	0.30
Weather	0.10	News	0.20
Flight	1.00	Dictionary	0.10
Foreign Exchange	0.10		

Source: http://www.c114.net

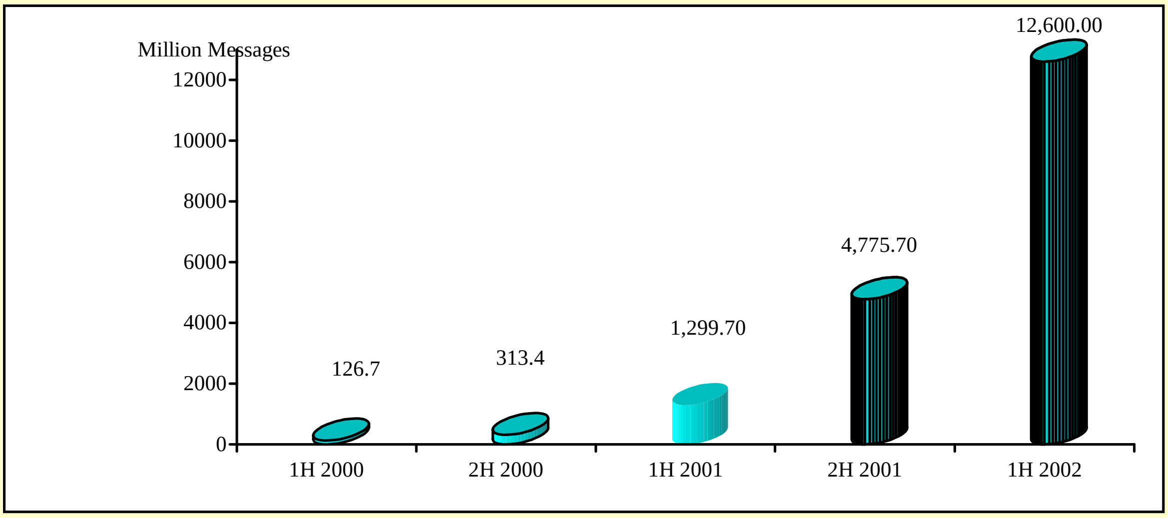
In order to facilitate the Monternet program, China Mobile set up a subsidiary by the name of Aspire in the last quarter of 2000. Hewlett Packard invested US$35 million in the company and owns 7% of it. Aspire is currently involved in the construction of the Mobile Information Service Centre (MISC) platform. The MISC is meant to serve as the common platform for all mobile Internet services of China Mobile. It is installed in stages based on a distributed structure in China Mobile's provincial operating subsidiaries. A unified MISC platform will provide mobile subscribers with mobile data roaming capabilities. The MISC will also provide a uniform data interface open to third party service providers, through which standard network information (such as billing) can be provided. The segregation of service platforms from the basic mobile communication services will ensure that all mobile communications networks developed through the platform can be smoothly migrated when they are upgraded to 2.5G and 3G, making them truly "forward compatible networks" [5].

Another strategy for facilitating China Mobile's Monternet program is the upgrade of its current circuit-switching network to a packet-based one. On 19 May 2002, again the World Telecommunication Day, China Mobile formally kicked off its General Packet Radio Service (GPRS) network in 100 Chinese cities. More advanced mobile value added services, such as Multimedia Short Messages (MSS), can be provided now.

Explosive Growth of SMS

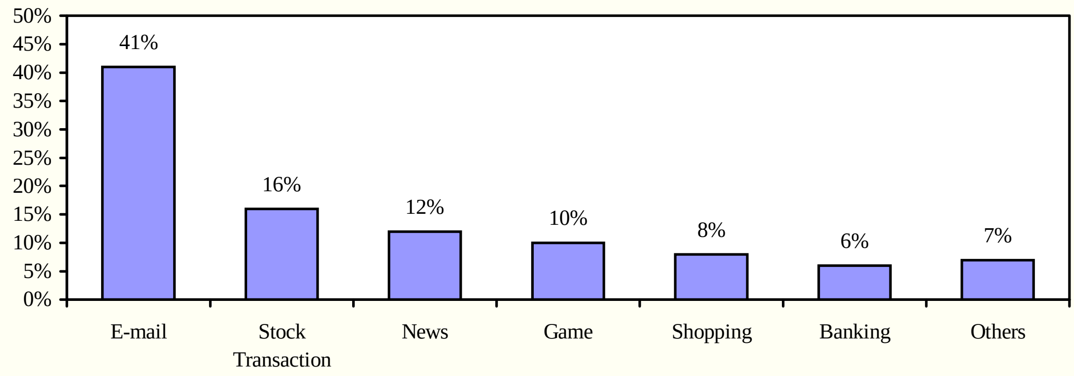
Despite concerted efforts on the part of operators to upgrade their technology, the real growth of mobile data services currently lies in the existing short message service (SMS) – one of the simplest value-added services based on the GSM standard. For China Mobile (HK), the usage volume of SMS increased from 126.7 million messages in the first half of 2000 to 4,775.70 million messages in the second half of 2001, representing an average compound half-yearly growth rate (CHGR) of 235 per cent (Figure 3). In the Chinese New Year day on 12 February 2002, more than 100 million short messages for greeting were delivered over China Mobile's network, which brought in revenue about 10 million Yuan, or US$1.21 million, within a single day.

Figure 3. SMS usage volume of China Mobile (HK)
Source: China Mobile (HK) Annual Reports



This phenomenal increase in SMS use is hardly surprising. According to market research sponsored by China Mobile, the mobile data service most on demand is e-mail (Figure 4) [6]. This reflects China's current structure of infrastructures. By the end of 2001, there were 145 million mobile subscribers but only 30 million Internet subscribers. This implies that the wireless Internet is more widely accessible than wireline Internet. Thus, subscribers use their mobile handsets as a substitute for the PC for sending and receiving e-mail, or, more accurately, text messages. The only difference is that SMS is subject to a length limit of 160 characters at maximum.

Figure 4 Demand for mobile data services in China



In fact, some wireline Internet portals also provide a service that enables users to send SMS via their PC to the handsets of mobilephone users. In this way, the simple SMS acts as a bridge between the wireless Internet and the wireline Internet.

According to the author's fieldwork in May and September 2001, the short message service has the following advantages in the specific context of Chinese telecommunication market:

- SMS provides an economical way to communicate. The end-user price for sending and receiving a message is 0.10 Yuan (US$0.012), whereas a one-minute call costs 0.40 Yuan (US$0.048). Currently, the minimum charged unit for mobile telephony in China is one minute. This implies that for unsophisticated information, the short message is more cost effective. And if the two communicating parties are located in two different cities, the advantage is even more evident, since the long distance charge for mobile service is 0.70 Yuan (US$0.084) per minute whereas SMS is not distance-dependent.

- SMS can be used in certain special circumstances. For example, when one of the two parties is in the middle of a conference, he can still receive and reply to short messages without disturbing other conference participants. The wide application of the short message system might change the phenomenon of talking on the phone in conference rooms and cinemas, - a phenomenon which has not been unpopular in some Asian economies.

- The short message might express some information more adequately than the verbal medium. A large number of messages, for instance, were delivered as greetings during Chinese New Year and on Valentine's Day.

- SMS is more suitable for broadcasting information. Many m-commerce companies, like Realvision, began to provide solutions for some companies to broadcast corporate internal information. Organisations such as insurance companies, hydro-electric companies, national and city police, which have several dispersed branches and employees, are heavy users of the short message broadcasting service.

- Due to some cultural factors, Chinese users are reluctant to leave voice messages but prefer to leave text messages. In China, once the called party is not available to answer the call, the call will be normally forwarded to a call centre where the human operator will ask the calling party if a message need to be sent to the called party. If needed, the human operator will type in the message and send it out to the called party in the form of a short text message. According to China Mobile, this arrangement has been highly preferred by callers, as they rarely leave any messages if they have to talk to the machine.

- According to some managers from China Mobile, the short message has become a kind of new literature. Many interesting messages, like some political jokes or short adult humour, are distributed and redistributed among subscribers. One of the reasons is that China still exerts strict control on these topics over the public media.

Above advantages of SMS, plus the revenue sharing business model, have lead to a win-win situation for both mobile operators and content providers. In July 2002, Sohu, the Internet portal company that was established in 1996 and was listed in Nasdaq in 2000, for the first time delivered its key financial milestone for 2002 with its first ever EBITDA

(Earnings before interest, tax, depreciation and amortization) positive quarter. Non-advertisement services, mainly SMS service, contributed US$2.76 million, or about 45% of the total revenues in the second quarter of 2002. Also in July 2002, China Mobile (HK) claimed the number of mobile data subscribers exceeded 40 million. Volume of SMS exceeded 12.6 billion messages in the first half of 2002. Revenue from non-voice businesses increased by 152 per cent over the same period in year 2001, and its proportion to total revenue increased from 2.4% to 5.4% compared to year 2001 [7].

Conclusion

The enormous growth of SMS services reveals the huge potential of the wireless data communication market in China. In a market where Internet has not been widely popular, the wireless system has played a significant role in meeting the demand for point-to-point and point-to-multipoint content communications. Experience in China indicates that an advanced but not user-friendly technology like WAP is not necessarily more welcomed than the simple but easy to use one such as SMS. Importantly, an effective business model is critical – the mobile data communication system should be an open system that is attractive to content providers, because, like Internet, it is the availability of large amount of content that makes data communication attractive to subscribers. At the same time, if more subscribers are attracted by mobile data communications, more content providers will be attracted to supply more content – this is a process of positive feedback. Additionally, a pricing scheme that enables mobile data communication to be a cheaper substitute for voice service is also important, at least in low-income economies where subscribers are sensitive to price. Last but not least, consumer behaviour should also be considered within the cultural and political context.

REFERENCES:

1. China Infonews at *http://www.cci.cn.net*

2. NTT DoCoMo home page at *http://www.nttdocomo.com*

3. Xu, Y. Return of the tigers: Asian-Pacific innovation in mobile communications, *INFO*, Vol.3 No.3, (2001), 195-206

4. *China Mobile (HK) Annual Report*, 2000

5. *China Mobile (HK) Annual Report*, 2001

6. Lu, T.J. The Development of Mobile Commerce in China, In *Proceeding of Asia-Pacific Mobile Communications Symposium*. (Hong Kong, 2000)

7. *China Mobile (HK) Interim Report*, 2002

Xu Yan (xuyan@ust.hk) is an assistant professor in the Department of Information and Systems Management at Hong Kong University of Science and Technology (HKUST).