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WIRELESS COMMUNICATION MARKET IN THE PRC

Paging market

With the emergence and growing popularity of mobile phones, the paging market in the PRC experienced a flat growth since 1996 and a decrease since 2001. As shown in the chart below, between 1996 to 2000, paging subscribers in the PRC grew from approximately 25.4 million to approximately 48.8 million, representing a CAGR of 17.7%. Starting from 2001, number of paging subscribers started to decline, in 2003, there were approximately 10.6 million paging subscribers in the PRC. The Directors believe that the paging market in the PRC is mature and will likely to continue to decline in future.

Mobile market

PRC's mobile phone market is expanding rapidly. With about 270 million subscribers at the end of 2003, it is by far the largest mobile phone network in the world in terms of subscribers. Despite of such fact, PRC's mobile phone penetration rate is still relatively low compared to many other countries in the region. According to IDC, a leading global independent research company in the telecommunication sector, the mobile phone penetration rate in the PRC in 2003 was only around 20%, whereas in other places in the region such as Hong Kong and Taiwan, penetration rate had exceeded 80% for the same period.

As at 31 December 2003, the number of mobile subscribers in the PRC reached approximately 270 million, representing CAGR of approximately 69% since 1996.



Number of mobile phones and paging services subscribers in the PRC

Source: China Statistical Yearbook (official source)

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Riding on the uptrend of the domestic economic expansion, it is forecasted that mobile subscribers in the PRC will continue to grow from 2003 to 2008. IDC expects that by 2008, the total number of mobile subscribers in the PRC will exceed 530 million with a penetration rate reaching 40%, and representing a CAGR of 15.5% from 2003 to 2008. The Directors believe that the growing mobile market in the PRC presents tremendous opportunities for providers of wireless terminals and various value-added applications.





Source: IDC

Mobile networks

Currently, there are three mobile networks in the PRC, namely GSM, GPRS and CDMA1X, with 3G expected to be launched no earlier than 2005. China Unicom is the sole operator that owns both GSM and CDMA networks. While the growth for 2G technologies, namely GSM, has been sluggish, the growth for 2.5G technologies, i.e. GSM, GPRS and CDMA1X, is expected to be strong in the coming years due to their much more enhanced data capabilities compared with 2G technologies. China Unicom's CDMA1X network, which can support up to 100K bps for data transmissions, as compared to GPRS' 30–50K bps data rate.

Mobile subscribers	2003	2004(E)	2005(E)	2006(E)	2007(E)	2008(E)
	(million)	(million)	(million)	(million)	(million)	(million)
GSM/GPRS	239.22	296.95	332.10	363.00	390.16	411.58
CDMA1X	19.07	31.30	45.13	53.78	60.49	66.25
3G	—	—	—	10.08	26.36	53.71
Total	258.29	328.25	377.23	426.85	477.01	531.54

Source: IDC

The Directors believe that the intensifying competition between the telecommunication operators over the existing mobile networks and the expected launch of 3G network in the PRC present tremendous opportunities to wireless system solution providers who can support telecommunication operators to provide value-added services to attract more subscribers. Meanwhile, wireless terminals providers who can offer terminals with high performance and capability to support various applications are also expected to benefit from such opportunities.

Wireless data market

In the PRC, Short Message Services (SMS) is one of the most popular applications. According to IDC, in 2003, there were about 181.8 million SMS users in the PRC, generating revenue of approximately US\$1.7 billion. IDC expects that in 2008, there would be approximately 454.8 million SMS users in the PRC, generating revenue of approximately US\$5.6 billion. IDC also expects the use of MMS to grow substantially in the PRC: in 2003, there were about 1.6 million MMS users in the PRC, while in 2008, the MMS users are expected to increase to approximately 81 million, representing a CAGR of approximately 119%. The Directors consider the China wireless data market to be substantial.



Mobile Data Users in PRC

Note: SMS and MMS refer only to person-to-person messaging. Value-added messaging are included in Other Data

Source: IDC



Mobile Data Revenues in PRC

Note: SMS and MMS refer only to person-to-person messaging. Value-added messaging are included in Other Data

Source: IDC

SMARTPHONE MARKET

Overview on global market

Smartphone offers a highly desired combination of mobile telephone with advanced applications, multimedia, and wireless features. With the increasing choice of smartphone products and improvement of telecommunication network, smartphones sales recorded substantial growth in recent years. According to IDC, the worldwide smartphone shipment in 2003 amounted to approximately 9.44 million units, and is expected to increase to approximately 94 million units in 2008, representing a CAGR of approximately 51.8%.

For operation of a smartphone, the minimal set of software is always included to manage a device's hardware capability and share it between application programs. This set of software is commonly referred as "operating system" or "OS". There are various designs of OS offered by international companies. Currently, there are five major operating systems of smartphones: Symbian, Palm, Microsoft Pocket PC, Microsoft Smartphone, and Linux. Symbian is currently the dominating smartphone operating system. Sales of smartphone adopting Symbian accounted for approximately 54.37% of total worldwide sales of smartphone in 2003.

The PRC

Smartphone market in the PRC is considered to kick off in 2000 with the launch of foreign brand smartphones. Since then, smartphone sales recorded substantial growth in the PRC, with CAGR of approximately 239.1% between 2000 and 2003 in terms of units of sales. According to CCID, another independent research company, in 2003, there were approximately 1,326,000 units of smartphone sold in the PRC at value of approximately RMB4.8 billion (US\$581 million).



Smartphone sales in the PRC, 2000–2003

Source: CCID

CCID noted that the PRC smartphone market has entered explosive growth phase. The market which previously predominately focused on business executives is now spreading to a wider spectrum of users, which fueled an even bigger growth potential. According to CCID, in 2003, smartphones using the GSM network accounted for approximately 99.9% of the market share in the PRC, while those using the CDMA network accounted for the rest of the market share. CCID expects that smartphones using GSM network will continue to dominate the market share in the near future given the current telecommunication infrastructure in the PRC. Moreover, according to CCID, in 2003, about 47.3% of the smartphones sold in the PRC were based on proprietary operating systems developed by various smartphone manufacturers. Among a number of operating system used by PRC smartphone providers. CCID believes that operating system with a more open structure such as Linux, Palm and Microsoft will be increasingly used. This is because a more open structure would efficiently support development of software application for the smartphone. Smartphone market in the PRC is currently dominated by foreign brands, while sales of domestic brands accounted for about 14.6% of the total sales in 2003. CCID also noted that in 2003, about 73.1% of the sales of smartphones were made through shops or malls specialised in sales of smartphones.

CCID considers that the smartphone market in the PRC is still at its preliminary stage. Smartphones that are able to handle sophisticated business data transmission and multimedia information have substantial growth potential. CCID is of the view that the growth of the smartphone market will on one hand extract existing users of PDA; and on the other

INDUSTRY OVERVIEW

hand, will be stimulated by the increasing use of mobile office functions and multimedia applications. CCID observes that the consumers buying smartphone are over 90% male and customers place emphasis on various factors with functionality, applications supported and pricing being the top three.

CCID expects that smartphone market in the PRC will continue to grow in the future owing to the following factors: (i) existing relatively low penetration rate (in 2003, the smartphone only accounted for 2% of the overall mobile phone market in the PRC; (ii) increasing applications offered by smartphones which are also used in PDAs and for handling sophisticated data transmission; and (iii) improvement of telecommunication infrastructure. With the expected launch of 3G, more wireless data and applications are expected to become available, which is expected to trigger increase in demand for smartphones.

CCID expects that from 2004 to 2008, smartphone sales in the PRC will grow at a CAGR of about 46.3% in terms of units sold from approximately 3.1 million in 2004 to 14 million in 2008. The sales volume is expected to grow from approximately RMB10.9 billion (US\$1.3 billion) to RMB39.9 billion (US\$4.8 billion).



Estimated smartphone sales in the PRC, 2004-2008

Source: CCID