



For China's telecom industry, 2009 is destined to be an extraordinary year due to the approach of long-thirsted-for mobile 3G era, which will have significant impact on current work and lifestyles. 2009 will also be a year full of opportunities and challenges because the coming 3G era will bring limitless business opportunities and impose more challenges on Chinese telecom operators.

The reshuffling of Chinese telecom markets has been brought to an end. The new China Unicom, China Mobile and China Telecom all focus their strategies on broadband mobile data services in order to achieve the objective of a smooth transforming from voice services to data services. Technologically, various 3G technologies and their evolutions become great concerns of telecom operators; while in terms of services, the key for 3G systems is their data services. As a result, high speed broadband data services see an era of rapid development.

Broadband Mobile Data Service Era is Coming

Zhang Zhijiang

1 Development of Mobile Data Services

Modern mobile communications began in early 1920s. At that time, communication and electromagnetic wave transmission experiments were done, and small-capacity private mobile communication systems were developed on shortwave bands. Such systems worked at low frequencies with poor voice quality and could not be applied in large-scale networking. At the end of 1970s, the United States widely deployed the Advanced Mobile Phone System (AMPS), which promoted the research of cellular mobile communication technologies worldwide. Consequently, the Traffic alert and Collision Avoidance System (TCAS) and Nordic Mobile Telephone (NMT)-450 were developed successively. These systems are analog Frequency Division Duplex (FDD) systems and are called 1G systems. They have many limitations in either technology or standard. For example, they can only deliver voice services, they cannot achieve global roaming and their capacities are limited. Therefore, they cannot meet the user demands for mobile data services.

To solve the limitations of 1G systems, the 2G digital mobile communication systems, represented by GSM and CDMA, were developed in 1990s. Compared with 1G systems, 2G systems have many advantages, such as high spectrum efficiency, large system capacity and good encryption performance. They are mainly designed for delivering voice and low-speed data services. With continuous social and economic development and the improvement of living standard, the users' communication habits gradually changed, expecting diverse services to satisfy their living and entertainment requirements. Hence, the

Biography

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development of mobile data services is of utmost urgency.

The statistics and forecast of global telecom operators' revenue structure show that the growth of traditional voice services has slowed down. The operators have diversified their services, among which mobile data, entertainment, media and advertisements grow at a faster speed.

Meanwhile, the main sources of the operators' profits are changing too, from voice services to data services. The statistics of Average Revenue Per User (ARPU) in European mobile market indicate the revenue of voice services does not increase although the traffic still increases. Moreover, the ARPU of voice services is decreasing. On the contrary, the ARPU of mobile data services is steadily increasing. As a result, the percentage of the revenue of data services in the total revenue of telecom operators increases, while the percentage of traditional voice services has decreased to

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about 50%.

For future mobile communication systems, one of its core services will be to access mobile Internet. Early mobile Internet was mainly applied in short messages and provided some simple interaction services for the users. In the era of 2.5G, such applications as photos, Color Ring Back Tone (CRBT) and games give the users more choices. Accordingly, the business model expands to the fields of advertisements and games. Rich contents improve the interactivity of applications, enabling mobile Internet to be a portable tool and a part of people's daily lives. Promoted by 3G technologies, mobile Internet meets a new opportunity of development. New applications have emerged one after another, for instance, mobile search engine, 2D code, mailbox, instant messenger, GPS and videos. These applications bring telecom operators more choices of business models. The wide application of mobile Internet makes it a necessary tool in people's daily lives as well as their lifestyle.

The great development of mobile Internet will surely drive the development of mobile data services. Telecom operators are now paying more and more attention to the development of broadband mobile wireless technologies when they construct their networks, which would undoubtedly urge the rapid development of mobile data

services. Meanwhile, more and more Internet providers have entered the mobile communication market recently and now cooperate with telecom operators. This will no doubt further propel the development of mobile data services.

2 Evolution of Wireless Communication Technologies

The increasing demand of the users for wireless data services, which require large bandwidth, pushes the development of mobile communication technologies as well as the improvement of transmission rates. The 3rd generation mobile telecommunication systems are developed and launched as a result of this push.

The most important feature of 3G systems is their high bandwidths and rates, which can greatly improve user experience in multimedia services and accelerate the coming of broadband mobile data service era. Currently, there are three main 3G modes: Wideband Code Division Multiple Access (WCDMA), Time Division Synchronous Code Division Multiple Access (TD-SCDMA) and CDMA2000. Although these modes enable wireless data rates and frequency efficiency to increase considerably, they still cannot satisfy the expectations of the users for next generation networks. As a result, 3GPP continuously releases new standards. So far, the evolution targets of WCDMA and TD-SCDMA have been clear, that is Long Term Evolution (LTE). The evolution target of CDMA2000 planned by 3GPP2 is Ultra Mobile Broadband (UMB). However, many CDMA operators around the world target their networks for LTE.

The ultimate objectives of the evolution of mobile communication technologies are flat network architecture, high data rate, short service latency, and low construction and operation costs. LTE has been selected as the evolution target of all 3G technologies. This inclination to a unified radio interface implies that the standard dominating the broadband wireless access market is not determined by the technologies but by technology maturity and market scale.

3 Four Key Issues to be Addressed

For most Chinese mobile users, 2009 brings hope. Three Chinese mobile operators are likely to introduce their 3G services, and three modes will compete with each other in the market. 2009–2011 will see the number of users grow at a high speed and the market structure shape, and broadband mobile data services will definitely be a powerful weapon for the operators to contend for users. But to develop mobile data services, there are still many

common issues to be addressed.

3.1 Services: Creating Differentiated Strengths Based on Industry Chain Cooperation

Unlike traditional voice services, the development of mobile data services requires close cooperation of all players in the industry chain, including Content Providers (CPs), content integrators, terminal manufactures, and mobile operators.

Technically, the three 3G standards can provide similar rates for applications, meeting the basic requirements of the users, so differentiated services will become an important competitive edge. If a network cannot provide any innovative service that can give the users fresh and new experience, it will be non-competitive no matter how well it is constructed. Therefore, in the development of value-added services, telecom operators, Service Providers (SPs) and CPs should work together to introduce more colorful multimedia services and offer the users better quality services in the times of high-performance networks. To introduce such services, first, there should be rich and innovative services; second, there should be friendly interfaces, allowing the users to enjoy the services, otherwise, the services cannot survive long; third, there should be enough resources and channels for new services to enter the market quickly.

3.2 Terminals: Getting Involved in Terminal R&D to Promote Win-Win Cooperation

In developing mobile data services, the terminals' capabilities should be considered in addition to the capabilities of network devices because their impact on the development of mobile data services cannot be neglected. In short, terminal manufacturers play an important role. Currently, different mobile data services require different terminals. For example, mobile TV, Video on Demand (VoD) and mobile games impose higher requirements on terminal screen, including color range, size and resolution; while mobile music services require better sound systems of the handsets. Without support of terminals, the mobile data services cannot achieve better development. Therefore, the terminal is a factor that may restrict the development of mobile data services. For the users, they will consider not only the terminals' functions, but also their shapes and appearances. To promote the development of data services, the operators should pay more attention to the development of terminals, get involved in the research and design of terminals, and customize their own terminals to attract target users.

3.3 Billing System: Developing Flexible Billing System to Support Differentiated Services

The billing system plays a critical role in the healthy

development of mobile data services. Unlike voice services, the billing of mobile data services involves not only communication duration, but also many new parameters, such as period and location. The diversification of parameters leads to a more complicated billing system. Moreover, the billing system should support the market competition strategies of the operators, for instance, differentiated services. Accordingly, mobile data services require the following features of the billing system: charging in real time in order to provide prepaid users with value-added services, being highly flexible so as to facilitate the making of various charging strategies, and supporting interconnection with partners' networks to enable roaming among different networks. In short, a good billing system can effectively promote the development of data services; otherwise, it will restrain the development.

3.4 User Experience: Continuously Creating New Services and New Business Models

For end users, they seldom care about the technology issues. What they really concern about

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the most are new services that the telecom operators are able to provide, new experience from these new services and related charging policies. All these concerns are challenges for the operators, forcing them to continuously innovate upon existing services and business models. In the coming 3G era, the operators have to take full advantage of the opportunity brought by mobile Internet for broadband mobile data services and have to find new service growth points in order to survive in the increasingly intensive competition.

4 Conclusion

In the coming broadband mobile wireless data era, mobile operators still take the core position, but they have to work closely with network equipment manufacturers, terminal manufacturers, CPs, and third-party solution providers. Only doing so, they can play the leading part of wireless services and embrace the "spring" of data services.