

## Calling for Further Innovation of Mobile Devices

Wang Jianzhou

Former Chairman of China Mobile

With many years of working in the mobile industry, I've seen its very rapid development. In the second half of 2012, China Mobile had its 700 millionth customer. Even though I already retired from the Chairman position at that time, that news still made me so excited. In China, no matter in the remote islands or in mountain villages, mobile phone coverage is always available. The global mobile communications industry is growing rapidly as well. The mobile phone further enables peoples' ears, eyes and noses, and has become a daily life necessity. The marriage between mobile communications and Internet really changes people's life.

As that great scientist, Freeman Dyson, has said, the technological revolution is like an explosion which is tearing apart the static world of our ancestors and replacing it with a new world that spins 1,000 times faster. If the world spins faster thanks to a huge number of technological achievements, then I believe mobile phones must be one of the most powerful propellers.

In the history of human development, each tool's revolution successfully accelerated the social progress. And the growth of mobile phones reflects the big role that modern communications technology plays in improving productivity and quality of life.

Information technology has always grown rapidly, and innovative products keep emerging. Even as we marvel at the big changes brought about by the information technology, new IT products continue to hit the market. When we say information technology changes people's lives, I think it's more about innovation, which really changes the way we live.

For more innovation of mobile devices, I want to make the following points:

### **LTE will enable new epoch-making mobile devices.**

When we look back at the history of consumer electronics development, in each phase, there was one extraordinary product that could redefine the consumer culture. For instance, in the market of music players, the Walkman used to dominate, and then was replaced by the iPod. In the market of mobile phones, the early flip phones' emergence gave people a fresh and new impression. And then BlackBerry added more functions, including checking and sending emails. Today, there is no doubt that the iPhone is a star product that is able to redefine the consumer culture.

Nowadays, when we talk about the next groundbreaking mobile devices, 4G definitely comes to our mind. Due to the data traffic explosion and the arrival of the "Big Data" era, LTE 4G is growing at a very fast speed, much faster than we expected. There are many

LTE commercial networks around the world, including LTE FDD and TD-LTE. The broad expansion of LTE is coming soon.

Currently, there are several models of LTE devices out in the market, with few varieties and issues like low battery life, etc. I believe those issues will be fixed soon. A wide variety of high-performance LTE devices are highly expected in the market.

History tells us that, along with the appearance of a new generation network, a new star product emerges as well. When 3G first came out, customers were asking about its use. When we told them the data rate of 3G is higher than that of 2G, they were still confused. Then it was the smartphone that answered the question fairly well. Now people all know that 3G is much better for Internet browsing. Today, people are asking about the use of 4G as well. Of course, we could say it's faster than 3G in surfing the Internet. But that's still the basic idea of 3G smartphone, and the strength of 4G is not brought into full play. If smartphone is the masterpiece for 3G, then people are now expecting the masterpiece of 4G to come.

This is a space with many possibilities, but they have not yet been fully imagined. HD video is one of the highlights. Professional video cameras with LTE module are able to do live broadcast. But this is just limited to the small group of professionals. How about for the common people to use? Video conferencing is well received by many companies. Usually, the meeting must take place in a certain meeting room. Thanks to LTE, we can join a videoconference by a smartphone or tablet any time we want. And machine simultaneous interpretation is also what we've been expecting for so long. Thanks to the high-speed data transmission of LTE, it becomes a very likely possibility.

LTE will trigger the migration to Mobile Voice over IP as well. What is the voice solution for LTE, which is a technology of data only? Voice over LTE will naturally become the best solution for LTE devices. Of course, in early the LTE rollout period, due to limited coverage, voice has to fall back on 2G or 3G networks. But once LTE completes its coverage, Voice over IP (VoIP) will become the mainstream. VoIP, which has been discussed for so many years, will just be provided as an OTT (over the top) service. When VoIP becomes the primary voice solution, it will open a new chapter in the hundred-year development history of the telecom sector.

Maybe several years later, when we look back, we will find what we expect from 4G today is too little.

Over the past two decades, mobile phones have been changing all the time, from the very early keyboard phone, then keyboard flip phone, to touch-screen phone. Mobile phones became smaller and thinner, but their screens bigger, with more functions.

What is a little pity is that due to the overwhelming market reception to touch-screen phones, today almost all smartphones are in the shape of a touch-screen phone. If you

visit a phone store, you will find mobile devices of different brands look very much alike. Even some manufacturers who used to pay a lot of attention to product differentiation began to follow suit, making it really difficult for the customers to tell the device brand either in appearance, or by the UI.

Mobile devices are not like PCs. They need more flexibility and variation. Consumers demand more diversified devices of both 3G and 4G.

When we talk about the issue of diversification, manufacturers will be concerned with the market reception. If they use the different operating systems, they are afraid of the lack of app development. The concerns are reasonable. I was told by a mobile game developer that they need different teams working separately on different operating systems for each new gaming product. As he said, application development would become more difficult with more operating systems. Of course, this issue can be solved. One of the solutions is the use of HTML5, which brought about a mature Web application platform that enables standardized interaction of video, audio, image and cartoons, and among different hardware. HTML5 is a very effective framework under which application developers can get rid of the restrictions of different operating systems.

### **Make mobile devices compatibility a reality**

For many years, people in the mobile industry have been longing for a *World Phone* that can work on different mobile networks in different parts of the world. With analogue technology, the first generation was the initial period of mobile communications, while network scales and subscriber bases were relatively small and people seldom talked about compatibility among different standards. The second generation brought big development of mobile communications, and despite its adoption of digital technology, there were still two incompatible standards of GSM and CDMA. After 2G, the mobile industry put its hope on 3G, whose full name is IMT-2000 meaning, International Mobile Telecommunications. However, the dream of compatible mobile device did not come true in the 3G era.

Now decades later, people are becoming more dependent on mobile devices and carry them wherever they go. Both customers and operators are more anxious to have compatible mobile devices. Therefore, compatibility has become an important target of LTE development. At the initial period, the international standardization organizations made integrated specifications for FDD and TDD network systems, which created a good foundation for the production of multi-mode devices. In addition to multi-mode, multi-band is also very important for device compatibility. Due to the scarcity of spectrum resources, operators in different countries use different frequency bands for LTE network, which made device compatibility more difficult. However, it is truly possible to achieve multi-mode and multi-band compatibility on chipsets through current semi-conductor technologies.

The goal of device compatibility is to support all standards with multi modes and multi bands. Multi modes refer to different standards in 2G, 3G and 4G, and multi bands refer to different frequency bands support within one standard. It is delightful to see that the wish of subscribers and operators has been taken care of by chipset and device manufacturers. With the shipment of multi-mode and multi-band chipsets, such devices will hit the market soon.

Besides compatibility, standardization is another issue. In fact there is no conflict between standardization and innovation. It is natural that manufacturers wish to launch devices with outstanding features. However, as the most common personal device, the mobile phone must, at its launch, address the interests of consumers. Therefore, standards are necessary in some aspects and require compliance by all players in the industry.

Take SIM for example. As a product from digital mobile communications, it separated the subscriber identity module from mobile devices. It was at first adopted in the GSM system, and then for CDMA. But in recent years, there have been some changes in the size of SIM cards. The difference between general SIM and smaller Micro-SIM caused some confusion for consumers as well as extra work for the operators. With a smaller size, Micro-SIM was largely welcomed by manufacturers, who introduced Micro-SIM devices one after another, and thus all operators offered services like replacing SIM with Micro-SIM. Given this situation, both manufacturers and operators requested a new SIM standard, and European Telecommunications Standards Institute (ETSI) took the lead in setting a new SIM standard, namely the Nano-SIM. At the moment, the above-mentioned three types of SIM are all in use. While to change the size or technical parameters of SIM is not a complicated job, what matters is a unified standard. Otherwise, a lot of unnecessary troubles will arise. At present, Nano-SIM has the smallest size, which is favorable for device design and manufacturing. A universal adoption of Nano-SIM standard will definitely bring convenience to manufacturers and consumers.

There are a lot of other standardization issues in addition to SIM. For example, the universal charger has been discussed for quite some time and is not yet addressed. On top of that, the issue of the wireless charger came along. I sincerely hope a universal standard for a wireless charger can be adopted by the industry from the very beginning.

More than one hundred years ago, since the proliferation of electrical power, the emerging electric appliances brought huge convenience to people's life. However, even today, different countries have different electrical plugs and sockets, causing trouble to the manufacturers and users. And it is very difficult nowadays to solve this standardization issue. As for mobile devices, I believe there will be more innovation and new products coming out, and early priority given to the standardization will benefit

their long-term development, as well as energy saving and environment protection.