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Report

ICT Development Trends (2014):

Embracing the Era of Mobile-ICT

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In our fast-growing global information society, technology has had a profound effect on every aspect of society and each individual's life. Importantly two distinct technologies: information technology (IT) and communications technology (CT) have gradually become integrated to form a new technology – ICT (information communications technology). Coupled with the huge success and popularity of the Internet, society has now indisputably entered the era of ICT.

Looking back at the development of ICT one of the most impressive events is undoubtedly the emergence and rapid adoption of iOS and Android smart mobile terminals, and the increase in value of the mobile Internet which has been boosted by the popularity of mobile terminals. This has not only helped to maintain and grow data traffic over operator's 3G networks, it has also brought about new opportunities and challenges to the ICT industry as a whole and deeply impacted its future development.

Observation of recent trends in the ICT industry shows that smart mobile terminals have gained in popularity to such an extent that we can label contemporary society with an "M" (Mobile) tag. The "M" tag has brought us not only the convenience of voice and data services, but much more. The ICT industry has now entered a new era – the mobile era and the term ICT should now be revised to include mobile. The concept of Mobile-ICT (M-ICT) provides us with a much better understanding of where we are now, and where we will be in the future.

From the perspective of Mobile-ICT, all the emerging information technology trends seem quite natural:

- **Service ubiquity**. The popularity of smart terminals and mobile broadband networks has bought about dramatic changes to people's everyday lives; touching everything from travel, shopping, socialization, and entertainment, as well as enterprise operations and new work styles represented by the mobile office. In fact, the mobile services that we enjoy today have long been provided on fixed terminals, when they were viewed as technological progress, rather than revolution. In the mobile era however, those services have impacted our life and work styles in completely different ways. Service ubiquity has become a reality and has changed the way we live and work.
- **User experience**. Traditional ICT provided voice services for the majority of users and high-end services (including voice and data) for selected users. In contrast, Mobile-ICT provides a combination of voice and data services to all

users almost ubiquitously. The performance of combined services cannot be measured by traditional ICT product performance indicators but should instead be evaluated by the user experience.

Service ubiquity and user experience will be key markers in the Mobile-ICT era. Nevertheless, the traditional ICT industry will continue to develop rapidly, leading to a new round of innovations in finance, transportation, energy, education, healthcare and other industries. However, to better serve society, the industry must continue to confront and solve many existing and new questions:

- How to effectively invest in the IT infrastructure of enterprises while satisfying their mobile working requirements?
- How to continuously satisfy the core demand of increasing user experience based on the vast number of subscribers?
- How to design more reasonable innovative business models, so that all parties in the industry, including mobile operators, can achieve fair economic returns?
- How to address the increasingly severe challenges on network security when society is relying more and more on network services?

While developing the new technologies needed for the network evolution we have considered the questions that confront the entire ICT industry and have observed the following development trends:

Ⅰ. Seamless mobile access

Smartphones and smart pads are no longer alone in this revolution. The “last-mile” access technology, represented by WLAN, will gradually become the mainstream wireless technology, providing access points that replace wireline broadband access. In offices and in homes, on highways and railways, at airports and on airplanes, wireless access technology that seamlessly integrates 3G/4G/WLAN will become prevalent in the next few years, providing flexible, reliable and seamless wireless network access to users, by means of ever higher bandwidths.

Ⅱ. Smarter, more flexible and wearable Mobile Devices

Smartphone CPUs have grown from dual core to quad core and even octa core. The processing power of smart terminals is rapidly increasing, and wearable devices such as smart glasses and smart watches have appeared on the market, demonstrating a potential that is still hard to assess, but leaves plenty of room for the imagination. The industry has progressed in a number of important ways with flexible screens, flexible battery and other technologies, which create more opportunities for smart terminals. The quick take-up of HTML5 is expected

to break the “walled garden” of APP stores, and web-based applications and local applications will co-exist for a long period of time.

Ⅲ. Anytime, anywhere

In the era of Mobile-ICT, services will be available ubiquitously thanks to the seamless access environment, increasingly strong and flexible smart terminals, and cloud computing technology. Mobile office, information sharing, socialization, electronic business, Internet finance and other services will be accessible to users at anytime and anywhere, further facilitating our life and improving our lifestyle with better experiences.

Ⅳ. Rapid growth of enterprise mobile applications

Broadband wireless access and the rapid development of smart terminals provide convenient usage scenarios beyond the mobile office. Supported by a rapidly progressing security technology and Internet-of-Things (IoT) technology, enterprises will follow the trend of Mobile-ICT when deploying both critical external services and core internal applications. Mobility will cover every aspect of enterprise management and operation. This will significantly enhance enterprise operations and production efficiency, and provide rich new possibilities for ICT enterprises to profit from the mobile Internet.

Ⅴ. Scalable bandwidth

The flood of digital services requires that every layer of the network infrastructure speeds up its own evolution; from the access layer to the core layer, and from the wired network to the wireless network. At the core, it is the demand for higher bandwidth that drives the evolution of backbone networks towards 100G bearer networks and beyond. The transmission rate of wired access networks, however, will remain one order higher than the rate of wireless transmission. This imbalance in development will face a bottleneck sooner or later. Only innovation can break the bottleneck to allow the bandwidth to match Moore's Law and the capabilities of information processing. Such technology will provide a connection for the smooth exchange of exponentially expanding data and reduces the disparity between human desires and natural resources.

Ⅵ. Intelligent cloud-based networks

Smart mobile terminals and cloud applications will fuel the explosive growth of data traffic, greatly increasing operating costs for operators that can’t be adequately covered by new revenue streams. Software Defined Network (SDN) and Network Functions Virtualization (NFV) have already achieved a certain level of popularity. Network convergence, software definition, cloud computing, virtualization and smart terminals will become the dominating forces that lead the next round of network technology revolution. Cloud radio, cloud EPC, optical and

package network, SDN packet switch, cloud storage, virtual desktop, smart terminals and cloud applications will become “recipes” for operators and enterprise clients to significantly reduce network equipment and operation costs.

Ⅶ. New traffic-based business models

ZTE’s own strategic research shows that mobile video traffic will occupy over 70% of total mobile data traffic by 2020. According to our predictions, mobile multimedia services will develop quickly in the next few years while video quality will definitely evolve from standard definition, to high definition, and then to ultra-high definition. Mobile video will ignite the explosion of mobile data traffic, and create entirely new traffic-based business models. With the explosion of mobile data, the core value of innovative business models for operators is to provide better traffic volume based services for individuals and enterprises, and transform the vast traffic flow into commercial value.

Ⅷ. Symbiotic digital ecosystem

The digital era builds a connected world where people and things are closely connected with each other. Any individual, enterprise or machine is possibly a consumer or a provider of information services, forming a brand new relational digital ecosystem. The system provides a “market” in which individuals and enterprises can exchange their information. The owner of the “market” place provides network infrastructure, operation services, channels and brands, and even a benefit sharing business mode. This thoroughly changes the situation in which enterprises develop only the capabilities and functions they demand, and will undoubtedly improve the organizational structure, service flows and operation and support systems of operators.

Ⅸ. Blurring of the physical and digital worlds

The physical world and the digital world will more closely interact with each other through information exchange. The business office, leisure, shopping, health care, education, entertainment, traffic and socialization will all inundate the mobile internet industry with its own value. A “physical atlas” will be built on the Internet, moving the physical world into the Internet and integrating the digital world and the physical world into one. All physical devices will be virtually mapped into the digital world, allowing people to feel and touch the physical devices in the virtual world through augmented reality. Thus, the interaction in the virtual world between people, between people and things, and between things will become comparable to the natural interactions in the physical world.

Ⅹ. Increased network security challenges

The Internet-based virtual society is open and interactive, with quick information dissemination. However, anonymity will easily lead to network fraud due to

virtual IDs. During point-to-point information dissemination, privacy and financial information is prone to leakage and abuse via socialization and electronic business tools on mobile phones. In the era of Mobile-ICT, with ubiquitous service availability, network security problems will become more severe, and be given greater attention in the future network development. However, risks always accompany benefits. When we depend on the network in every aspect of our social life, the need for access will definitely make it difficult to find a once-for-all solution. This will remain a long-term technological and social issue

Great changes will occur when we move from the era of ICT to the era of Mobile-ICT. User experience, disruptive technologies and innovative business patterns will continuously reform this new industry, providing endless opportunities and reshaping our society in a manner that is way beyond our imagination.