New Blue Ocean of Wideband Wireless Mobile Internet: Modern Service

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Abstract:
Wideband Wireless Mobile Internet (WWMI) has become one of the most important technologies for Modern Service. The Modern Service information communication multi-access network can easily realize the new operation modes formed by various Modern Service support systems. We think that under the new operation modes, the charges on calling and information will become more negligible, while the charge on services provided by the direct service support of various Modern Service platforms will turn into a major revenue source. It is suggested that the operators build an operation service support platform with common services to cooperate with thousands of information websites, help clients to transform information into profit and carry out operations and services.

1 Connotation, Origin and Development of Wideband Wireless Mobile Internet (WWMI)

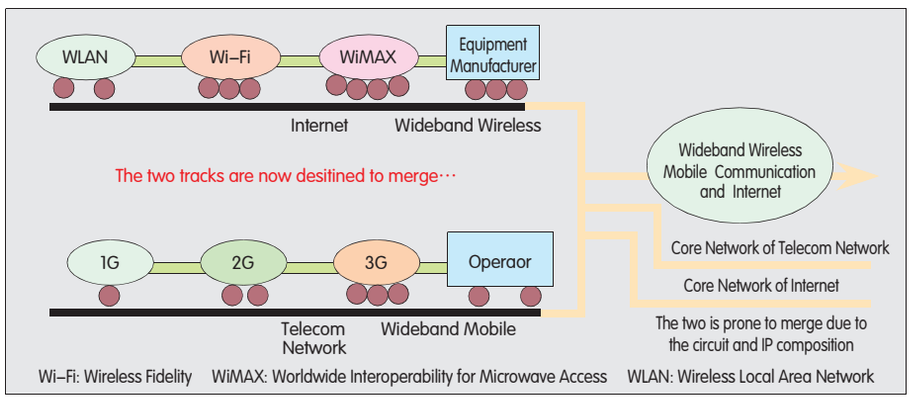
1.1 Connotation and Origin of WWMI

There lacks an official definition for WWMI so far. Let's just look at threads of its technology development to see what it means for us.

We know that the Internet derives from the Transmission Control Protocol/Internet Protocol (TCP/IP) technology with its original intention of setting up a global information network featured by "equality, freedom and free of or low charge". In 1980s, the US government passed a law that admitted enterprises into the Internet. Since then, big companies started investing heavily in the Internet for commercial purposes, which as a matter of fact drove the rapid development of the Internet. In the arena of wideband wireless access, international standard agencies launched a series of standards and forums (a typical example is IEEE802), and also industry-related forums such as Wireless Fidelity (Wi-Fi) and Worldwide Interoperability for Microwave Access (WiMAX), heralding the age of wideband (broadband) wireless mobile access for the wireless access technology of the Internet. Figure 1 depicts the origin of WWMI.

The software and hardware equipment manufacturers, Intel, Cisco and Microsoft, for instance, have been organizing and guiding the wireless access technology development for the Internet. The Internet has come with a congenital deficiency, that is, the lack of an integral, unified and reliable management system, good charging equipment and network support system. Much different commercial patterns coexist in a flat structure of the network. Anyway, the Internet is popular because of its easy user access, low charges and mass information storage. Both Wi-Fi and WiMAX802.16D can be connected with the fixed network through wireless ways. But since the release of IEEE802.16E, wideband wireless mobile system started to integrate with the Internet, and this standard has been accepted by the ITU as the sixth international 3G standard.

Operators have always played a core



▲Figure 1. Origin of WWMI.

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role in the telecommunication network from 1G through 3G. Operators build the network with guaranteed high quality, security authentication and a support system. The commercial pattern centered on operators has been functioning for years, while equipment vendors, Content Providers (CPs) and Service Providers (SPs) all have been properly provided for and thus grown fast. The problem, however, is that the access is expensive and not very convenient, in addition that the contents and applications are not sufficient enough.

It's obvious that the wideband mobile communication with the telecom network being its core network needs the abundant contents and applications of the Internet; while the wideband wireless Internet with the Internet at its core needs the large number of mobile phone users and also the Quality of Service (QoS) of the mobile telecom network, as well as the support technologies, to guarantee its security and confidentiality. The two, once integrated, makes the WWMI. Needless to say, the core networks of the two are completely IP–supported. In China, however, the core network of operator's telecom network and that of Internet are physically independent. The Internet may be accessed by way of the fixed network or Wi–Fi. But for mobile communication users (who use mobile phone or other mobile terminals) to access the Internet, the Gateway General Packet Radio Service Supporting Node (GGSN), Serving General Packet Radio Service Support Node (SGSN) or other similar facilities should be required. In other words, operators always want to keep their telecom network on a reliable IP core network. We currently refer to the post–2.5G access wideband as provided by High Speed Downlink Packet Access (HSDPA), High Speed Packet Access (HSPA), Long Term Evolution (LTE), Wi–Fi and WiMAX as wideband wireless mobile communication.

A general definition, therefore, is given to WWMI: By WWMI it means that users are able to access the Internet using their wireless mobile phones (including Wi–Fi, iphone and Gphone), Personal Digital Assistant (PDA) or other terminals by way of the Wi–Fi, WiMAX, GSM, CDMA or WCDMA network.

1.2 Development of WWMI

From above we know that once the Internet originally accessed mainly through fixed line ways (including the wireless) merges with the mobile communication system, its user base, which comprises mainly the laptop users (over 200 million in China) in the past, will expand to all users of wireless mobile terminals (that is over 600 million in China alone). The QoS, security and network management system of mobile communication system make sure that any service needed anytime and anywhere is obtainable, which is impossible for any communication system or the Internet in history. Many Internet Content Provides (ICPs) and SPs have harvested much from this industry chain.

On the other hand, mobile communication operators also capitalize on this network integration by providing plenty contents and services to their subscribers. As new technologies, such as IP telephony and IPTV, are made available, the tiny profit model of the Internet has driven down revenues of operators. In addition, the inverse 80/20 situation has become worse than before, that is, 20% of the income consumes 80% of the resource. While the WWMI is very well received by users, problems arise. After all, what does the future hold for operators? The answer should lie in Modern Service, which is expected to turn into a new blue ocean of the WWMI applications.

2 Connotation and Development of Modern Service

Recent years have witnessed the boom of Modern Service in China. We'll talk about its connotations and its relation with the Information and Communication Technology (ICT), especially with the WWMI.

2.1 Connotation and Development of Modern Service

The term Modern Service is originated in China, from the CPC's 15th Congress Report, to be exact. It also has a general name "Service Science Management and Engineering" (SSME). IBM was the first to propose the concept of "Service Science".

Modern Service was clearly defined in 2003 in China's National Guideline on Medium– and Long–Term Program for Science and Technology Development. In 2006, China's National Science & Technology Pillar Program was initiated and the project "Modern Service Common Technical Support System and Application Demo Project" was set up.

Based on efforts of specialists and experts, the world has come to a consensus on the complete definition of Modern Service, which, with some additional information given by the author of this article, goes like this: Modern Service is a knowledge– and technology–intensive service industry that is developed on the foundation of information and telecommunication technologies and modern management philosophy. Modern Service covers not only the service state innovated to adapt to the technological development and social progresses, but also the traditional service industry that is reformed, integrated and enhanced with the help of modern technology, especially modern information communication technology[1–2].

The definition of Modern Service may be understood from the following aspects:

(1) Modern Service starts on condition that both agriculture and industry develop to a certain level; especially when the manufacturing industry and ICT are advanced enough to a stage, for example, the present economic development of China.

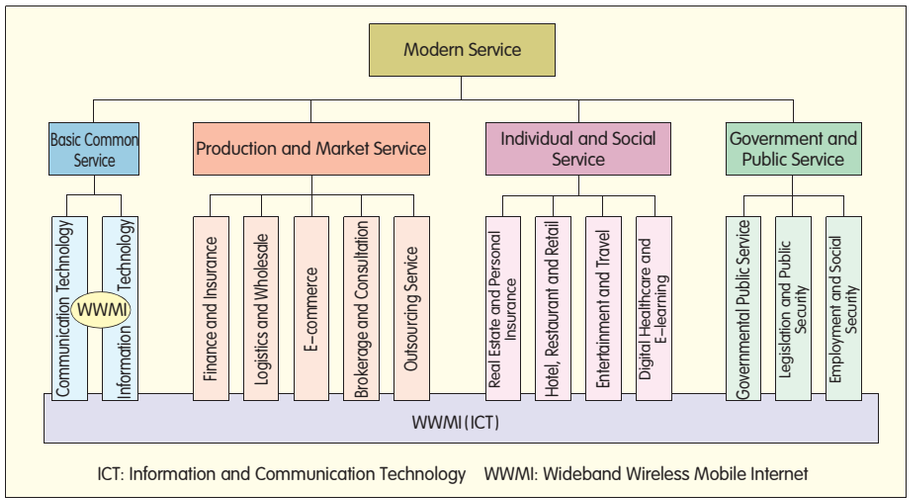
(2) Modern Service needs support of high technology, for example, the WWMI and its supporting technology. It also needs directions of modern management theories. In addition, it needs creative commercial mode, operation strategies, as well as a legislative and political climate that is completely supportive for its development.

(3) Modern Service is a new industry featuring intensive knowledge and technology, for example, credible e–commerce and online game. It may also be the traditional service industry that is reformed and significantly

enhanced with the help of modern technology, especially ICT. Modern Service has its own expansion need that is to be supported on an extensive network. Ctrip.com is such a good example that takes advantage of wireless mobile Internet technology to turn a traditional industry into modern service powered by modern management philosophy.

(4) Modern Service is a new model of service industry that is credible, highly efficient and convenient.

Modern finance and modern shipping are examples of Modern Service. But those Wall Street financial by-products that have caused financial crisis should not be. The growth of Modern Service brings about not only opportunities for intellectuals, but also jobs for workers.



▲Figure 2. Significance of WWMI for Modern Service.

2.2 Demands for Developing Modern Service in China

The global economic crisis that broke in 2008 and the adjustment of Chinese Industrial structure are both telling us a truth that Modern Service is what China's long-term stable economic growth relies on.

The human beings have seen the society evolved from the agriculture type, the industrial type and now the service type, which by many, is referred to as the information society. A society with omnipresent information and network is being shaped up along with the developing process of the information superhighway. Information service is developed on this basis that when the agriculture and industry of a country is advanced to a certain extent, the country is prone to take some transform, that is, to turn into a service-oriented society that is technically supported mainly by information communication. This has actually been the story happened thirty years ago in many countries. The GDP of service sector of developed countries accounts for a percentage of more than two times the total of industry and agriculture; while in China, it is as low as 3/4 of the total of the other two. For example, the service sector of the US now accounts for 80% or so of GDP, leaving just 20% for industry and agriculture. In China, the service sector accounts for only 40% or so of the GDP, and then 40% goes to industry and 20% to agriculture. To catch up with the major economies, China has to work much harder on its service sector, especially Modern Service[3-4].

2.3 Significance of WWMI for Modern Service

The growth of Modern Service relies heavily on the ICT, of which the WWMI technology is the most important component. We know from Figure 2 that the ICT (WWMI technology included) itself belongs to Modern Service, and then again, many other traditional and new-model service sectors, and industrial and agriculture sectors also require its support to become parts of the Modern Service.

It's common knowledge that the WWMI technology is currently the part of ICT that is the fastest developed, most widely extended and most alluring.

We should know that the WWMI technology plays a critical role in the future of Modern Service, for example, the digital healthcare technology as listed in Figure 2. Without reliable and high quality broadband wireless communication and Internet, it'd be impossible to carry out healthcare service anytime and anywhere (in the ambulance, in the wilderness, for instance). Anytime and anywhere accessibility is also required for other services including logistics, e-learning and consultation. In a word, the WWMI technology is setting up a broad service-supporting platform[5].

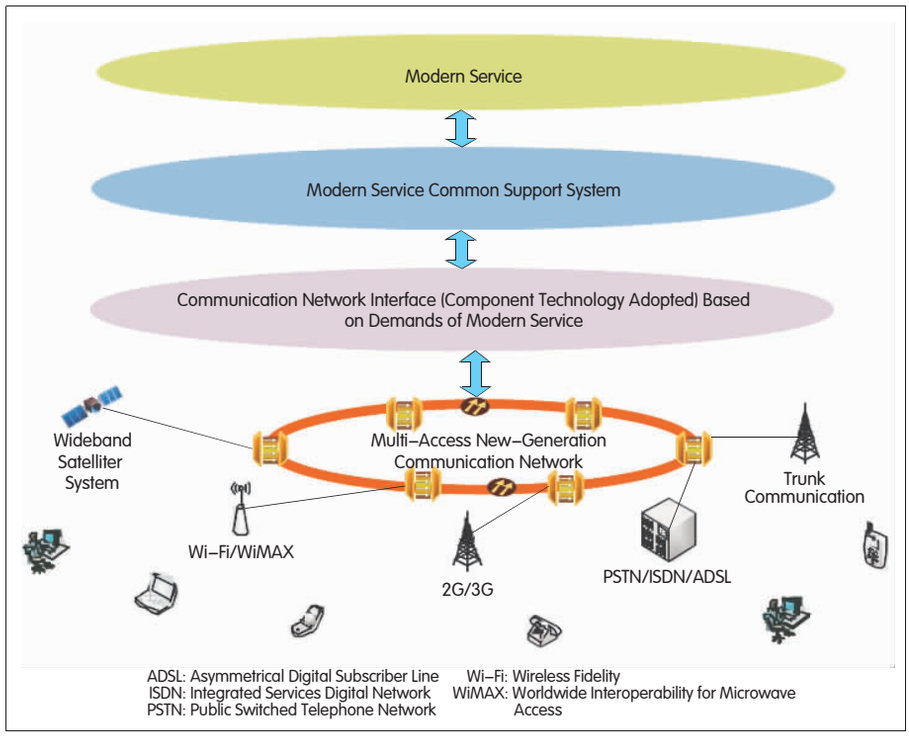
2.4 How WWMI Support Common Service Platform for Modern Service

Modern Service covers a wide range of contents and it's very important to use the WWMI technology to support its development. This is why in 2006 China initiated the "Eleventh 5-Year Plan", that is the National Science & Technology Pillar Program, and the project "Modern Service Common Technical Support System and Application Demo Project" was set up.

Much research work has been done on the common service technology and related theories. The common service technology is deemed as existing in potential opportunities and will be extensively applied in industries, especially in the procedure when numerous products or industrial processes are being formally constituted. Simply speaking, the key to common service technology is to extract those modules with identical or basically the same functions from several different systems. This way, repetitive R&D work is avoided, cost is lowered and quality and efficiency are boosted.

For the sake of cost efficiency, select the common technologies and modules needed by various systems of Modern Service for research and development, the result of which can then be applied in related service systems.

Figure 3 depicts one of the main tasks finished in the "Eleventh 5-year" plan period, that is, the Modern Service



▲Figure 3. Multi–access network of Modern Service information communication network.

information communication network multi–access network and adaptation layer. The network may be conveniently transplanted to any support system of Modern Service that needs these functions.

Modern ServiceModern Service Common Support SystemCommunication Network Interface (Component Technology Adopted) Based on Demands of Modern ServiceWideband Satellite SystemMulti–Access New–Generation Communication NetworkTrunk Communication

Modern Service with the support of ICT (WWMI included) will require:

• Delivering voice, data and video services with reliable security support;

• Making the access network available that is powered by necessary communication technologies and Internet technologies (that is, common service technologies)

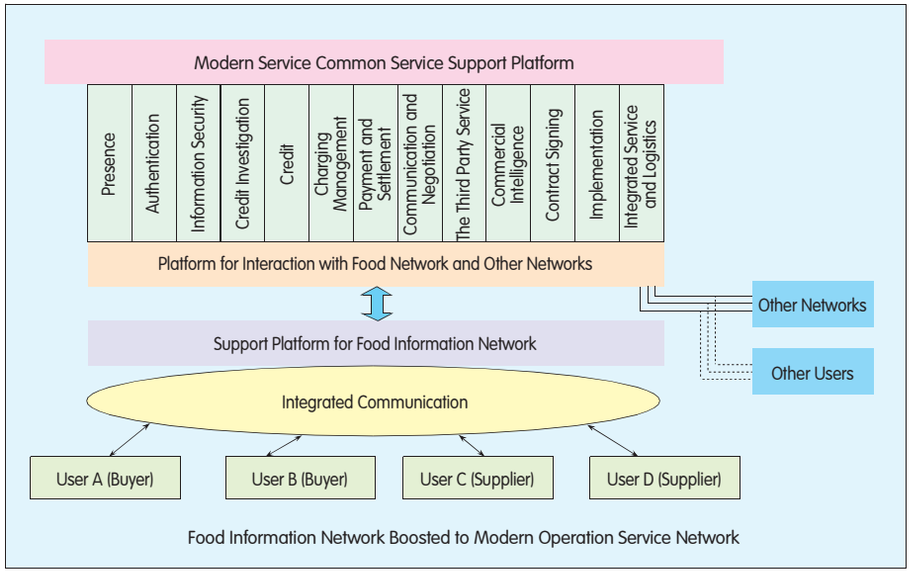
• Making information and communication available anytime and anywhere. Access approaches will then include PSTN, GSM, CDMA, 3G (WCDMA, CDMA2000 and TD–SCDMA), Wi–Fi, WiMAX, trunk communication, satellite, WWMI and the Internet as well. The WWMI technology is the most important access media and common module of Modern Service[6].

To support the operation service, Modern Service requires that the common service system is available with the credit, authentication and credit investigation modules, with the credit and authentication modules being the key to the success of Modern Service in China. Figure 4 shows a network boosted from a food information network to one powered by modern operation service.

So far the common service support experimental platform of Modern Service has been worked out. To prove its feasibility and usability, we have cooperated with China Food Network in terms of technology and application. China Food Network has boasted millions of daily visits as it began to provide instant and reliable food information which can turn into enormous commercial opportunities. However, the network remains but a network of information because it lacks some functions, such as electronic authentication for broadband wireless mobile access, information security, charging management, presence finance and logistics. Once the common service support system platform is merged into the original food information platform, the latter will soon turn into a platform for safe electronic commerce services anytime and anywhere, as what we expect in Modern Service.

2.5 WWMI Sailing into New Blue Ocean

The past thirty years have seen rapid growth of China in ICT, yet the profits of telecom operators, manufacturers and CPs have been falling in recent years due to the impact brought by Internet and IP technologies over traditional telecom industry. The lack of interest balance between users and enterprises has since driven down significantly the



▲Figure 4. Common service support platform connected with a food information network.

passion of re-investment of telecom operators, which in turn will understandably have a bad effect on the future of ICT and Modern Service.

Facts make us believe that Modern Service will become the next blue ocean for ICT, especially WWMI. All traditional and new-model service industries should rely on WWMI and other related technologies for their growth and people will then be able to access services anytime and anywhere, as what we expect the modern service should hold for us. We should now strive to go down along the industry chain to get to the service industry, to push the information-based agriculture and industry towards Modern Service, to merge agriculture and industry with the information branch, to the end that new-model modern service sectors are formed. This is the path for China to go on with the development of ICT.

To play a leading role in the developing process of Modern Service and to bring in more revenues, telecom operators have to make full use of their own information communication network (especially WWMI) resources to establish an operation service support platform that is orientated for industry, agriculture and service. On this platform that provides all kinds of safe operation service supports, the new electronic commerce age commences for small and large enterprises. Only when operators' services get directly involved in the operation, production, sale, procurement and logistical processes, can we expect operators' profit to grow significantly. Users would be willing to pay for service fees (including information fee, communication fee and broker's fee) as long as the service provided by operators is safe, reliable and beneficial to users. Till then, operators will function just as current fund brokerage agencies as their contribution to users and earnings from users are directly related with users' income. Once operators make this new operation model workable, the charges on calling and information will become much less important while the charge on services provided by the direct service support of various Modern Service platforms will turn into a major revenue source. Until then, operators will reach a higher level of supporting operation service and sail into the new blue ocean that belongs to them by its nature.

3 Conclusions

This paper hopes that operators are able to take advantage of their own resources, namely, hundreds of millions of individual, enterprise and government users; information networks based on the operator-provided IP core network; broadband wireless mobile communication system and Internet that covers China and the globe; as well as the guarantee technologies and systems they already have and will own.

The enormous market potential needs operators to help develop China's Modern Service. That is, to set up an operation service support platform that features broadband wireless mobile communication and Internet access, as well as common services (with high credibility and security at present). Such a platform provides direct services to individuals, enterprises and government, including voice, data, video, commerce and operation services. Agreements should be reached between operators and banks, taxation agencies, and industrial/commercial management agencies to guarantee the security and reliability of the platform. The platform can also be used to cooperate with other thousands of information networks so that the information can be transformed into revenue sources as it helps with operations and services.

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Biography

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Song Junde is a professor of Beijing University of Posts and Telecommunications. He is also the chairman of China Mobile Internet Special Group (CMIS) of China Communications Standards Association (CCSA), an honorary doctor of Moscow State Institute of Electronic Engineering, a member of Discipline Review Team, Academic Degrees Committee of the State Council, and the chairman of Chinese branch for International Federation for Information Processing (IFIP) TC7. He has published more than 200 papers and 13 books.