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The formation of China's Mobile TV standards/regulations and for future sustainable development: Socio-technical translation process study for the China's Mobile TV standard

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**The Formation of China's Mobile TV Standards /Regulations
and for Future Sustainable Development – Socio-technical
translation process study for the China's Mobile TV standard**

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ABSTRACT:

The China telecom mobile business has grown fast during the past ten years. For example, China Mobile subscribers have increased from 13.68 million to reach 1.146 billion in March 2013; Mobile Internet subscribers grew by 13.94 million in March to reach a total of 817.39 million. The mobile teledensity (penetration rate) in 2012 rose to 82.6, up from 73.6 at the end of 2011.

Digitalizing the signals of Audio/Video for TV is the first step for digital Mobile TV. There were four stages (2003-2015) for the implementation of China's audio/video digitalization. Stage one: major cities in the eastern coastal and western inland parts of China as well as provincial capitals in the centre of the nation by the end of 2005. The second stage aimed for the 2008 Beijing Olympic Games which included cities completed in the first stage. In the third stage, cities would be added in the middle and western areas. The fourth stage will end in 2015 when the whole country will be able to connect to digital cable. Analogue TV broadcasts will be terminated in 2015.

The Chinese mobile TV market has experienced competition in standards. The short-listed of five candidate standards were: DMB-T/H, T-DMB, CMB, CM-MB and CD-MB, each standard was supported and developed by different companies and departments of authority. We will use the Actor-Network Theory (ANT) to study the cooperation process between actors of Mobile TV industry chain, telecom operators, broadcasters and regulatory bodies for China's Mobile TV Standard. The Actor-Network Theory (ANT) will act as an important tool to understand the Chinese way of new technology standard decision making and implementation. The ANT, Michael Serre's work influenced Bruno Latour and others like Michel Callon.

In this paper, we will investigate what kind of regulative bodies within China were formed and how they have cooperated. This is the principal research question. We use the Mobile TV standard development from standard competition phase to deployment as a beacon that elucidates which Actors came together to oversee regulatory actions and how they influenced the regulation decisions towards the emerging market. Furthermore, what actors influenced the decision-making? These are sub-questions that we will investigate. This paper will also discuss regulatory issues, business models, market drivers and barriers, and subscriber forecasts.

Key Words: China's Mobile TV Standard, Regulation, The Actor-Network Theory.

1. Introduction:

A mobile TV standard is the critical factor for the success of the entire Mobile TV business, for the whole industry chain--from chips, core equipments to end-user terminals would be implemented adhering to an approved standard. After the digital GSM networks began to be established in China in 1994, several universities, government Institutions and different ministries started to carry out research into Digital TV and Mobile TV standards.

This paper referenced and followed the definitions mainly from: The final white paper titled "Mobile TV: The Groundbreaking Dimension" by mobile TV UMTSF/GSMA joint work group (UMTS, 2006); UMTS Form 2nd white paper "Sustainable Economics of Mobile TV Services" by Mobile TV joint UMTS Form/GSMA (UMTS, 2008). And UMTS Form. Mobile TV Joint UMTS Form Work Group. "Mobile TV Advertising" 3rd white paper. (UMTS, 2009).

Since the China's mobile TV infrastructure had a substantial market potential, many foreign (overseas) and local suppliers competed in China. The mobile TV technologies including: Digital Video Broadcasting –Terrestrial/ Handhelds (DVB-T/H), Digital Media Broadcasting Terrestrial/Satellite (DMB-T/S), U.S. Qualcomm's Forward Link Only (Media-FLO), and Digital Video Broadcasting – Satellite service for Handhelds (DVB-SH) were all involved in the competitions.

There were at least five local groups who followed the technologies that participated in the test and in its evaluation.

(1) Digital Video Broadcasting –Terrestrial/ Handhelds (DVB-T/H) this group headed by Tsing-hua University – one of the top technologies oriented Universities in China, (former incumbent president Hu and head of the Congress head Wu were the graduates of Tsing-hua). This University hoped to be the favorite to gain the license).

(2) Terrestrial-Mobile Multimedia Broadcasting (T-MMB) from Beijing Nufront and supported by Ministry of information Industry (MII).

(3) Cell Multimedia Broadcast (CMB) and Multimedia Broadcast and Multicast Service (MBMS) are 3GPP standard and have best served the WCDMA networks; Huawei adopted this system and is one of the world's top telecom equipment suppliers.

(4) China Digital Multimedia Broadcasting (CDMB) from China Radio Standardization Association (CRSA).

(5)China Mobile Multimedia Broadcasting (CMMB) from The State Administration of Radio, Film and Television (SARFT)-the authority for all China broadcasting organizations and contents.

Obviously, every potential candidate standard was supported by a strong authority (Woyke, 2008).

The purpose of this paper was to investigate what kind of regulative bodies within China were formed and how they had cooperated and in this paper also tried to find out what was the specific way the Chinese government used while making a national decision? Are there any lessons that can be learned for any developing countries? The growth rate and economic performance of China for the past two decades have been good. Information from International Monetary Fund (IMF) indicated that China's share of worldwide GDP would grow from 1.7% in 1991 to 11% in 2014. China's information Industry was an important vehicle in driving this radical shift in economic prosperity and culture.

Why and how the national decisions have been made? The decision for China's mobile TV standard was a serious and profound problem and very complicated. We view this process as a social-technological transformation and construction case, and therefore we will use Actor-Network Theory (ANT) to investigate the formulation of a national decision making strategy and regulatory structures (Latour 1996). The ANT four steps for the translation will be discussed; the regulator and regulation discussion will help to investigate what kind of regulative bodies within China were formed and how they have acted. (Collins & Murrone, 1997).

What kind of Regulator and regulations had China formed to conduct the Mobile-TV standardization and deployment? Normally, it would take years to develop the industry chain elements for upstream and downstream manufacturers. Mainly these covered chips, equipment, handsets and services. From a global marketing point of view, will there be an opportunity for compatibility?

The China Mobile Multimedia Broadcasting (CMMB) standard was announced as the national mobile TV standard by China's government, and the formal announcement was made on March 22, 2010. The trials of this standard were carried out during the 2008 Beijing Olympics (Clark, 2010).

But, China's neighboring countries launched mobile TV services much earlier; Korea's DMB-based service was introduced in 2005 and Japan's DVB-H-based service started in April 2006. What was the reason for China's delay? Were there any advantages or disadvantages for the late launch of the Chinese standard? We will try to analysis the current situation and predict

the sustainable development paths. This paper will briefly introduce the development path of China's mobile TV standard, the ANT four steps, the results and current developing status, discussion on the government strategy of national decision making and conclusions, these will be the main elements of this paper. We conclude that every developing nation should follow its own specific background and culture for its own course; countries with similar backgrounds to China might get some ideas from China's unique path, overseas investors may learn something while doing business with Chinese companies.

2. China's Mobile TV Standard Development Path:

2.1 Five Mobile TV Technologies in China local competition:

(1)DMB-T/H: Digital Media Broadcasting-Terrestrial/ Handhelds (DMB-T/H). In August 2006, the Chinese government announced a new standard for High-Definition (HDTV), called GB 20600-2006 that would support both offices/residential customers, using mobile broadcasting allowing speeds up to 250km/hr for the receiver (e.g. in a bullet train). The core technologies were Time Domain Synchronous – Orthogonal Frequency Division (TDS-OFDM) + Low Density Parity Check (LDPC). The developers were Tsing-hua University and the famous Silicon Corp, based in Fremont California U.S.A. Intel also invested \$40 Million in the research and development of this technology. The 2008 Beijing Olympic Game broadcasting network adhered to the above standards and used UHF &VHF channels with 8MHz bandwidth supporting a transmission rate from 4.813 Mbit/s to 32.486 Mbit/s. In late December 2008, SARFT announced that it would invest 2.5 billion Yuan (US\$ 366 million) to build a national digital TV network based on the GB 20600-2006 standard (Karamchedu, 2009a).

(2)T-MMB: The Terrestrial-Mobile Multimedia Broadcasting (T-MMB). Standard developers were NuFront Co, Ltd, Communication University of China in Beijing and South-East University in Nanjing. NuFront was founded in 2004 in Beijing by a group of Chinese ICT professionals who had graduated and worked in the U.S. for a period of time and was a high tech company dedicated to the area of wireless broadband communication and broadcasting, IC design etc. The T-MMB standard could utilize both 1.7 MHz and 8MHz and encompasses the following areas: Higher Spectrum Efficiency, Higher operation speed range and wider range for frequency tolerance. Before starting the research and development of T-MMB standard, the authorities such as MII, SARFT and National Development and Reform Commission (NDRC) were all aware of the initiation of NuFont's efforts and MII was one of the strongest supporters of this standard. T-MMB passed the stringent criteria for technical evaluation process put forward by National Intellectual Property Bureau. Mobile phone manufacturers, such as Samsung, Haier,

and Amoi, have finished T-MMB testing and if this standard is granted it will be ready for mass production.

(3)CMB and MBMS: Cell Multimedia Broadcast (CMB) and Multimedia Broadcast and Multicast Service (MBMS) are 3GPP standard and have best served the WCDMA networks; Huawei were adopted this technology and these standards were developed and launched, the trials were done and accepted by Hong Kong's telecom operator PCCW networks in August 2006. 110,000 employees in Huawei were the pioneers to use the phone and technology, this standard was ready for mass use if it was granted by the government.

(4)CDMB: The standard is China Digital Multimedia Broadcasting (CDMB). This standard was backed by China Association for Standardization (CAS), Beijing University of Post and Telecommunications (BUPT), the University of Electronic Science and Technology of China, China Electronics Technology Group Corporation (CETC), and China Electronics Corporation (CEC). Thus up to eight organizations worked together to develop the standard. The technologies used are TD-CDMA +DAB (GY/T214-2006) +AVS (GB/T20090). CDMB announced it should be completed in May 2007. (Wang, 2007)

(5)CMMB: The China Mobile Multimedia Broadcasting (CMMB) standard. This is also known as Satellite Terrestrial Interactive Multi-Service Infrastructure (STImi). The State Administration of Radio, Film and Television (SARFT) fully supported the construction of this standard. Between 2002 and 2006, its research department carried out serious studies of the world's available standards and tried to adopt one which would best fit China in the future. From 2006 to 2008, for the preparation of Beijing Olympics Games, over 100 industry companies participated in the test; in 2008, between March and October, 37 cities experienced the trial, and a much larger trial test started after October 2008 and attained more than one million users. In 2009, SARFT almost completed the development cycles for the commercial launch. There were 6 chip manufacturers and more than 30 types of terminals that supported CMMB. Some analysts predicted that CMMB will serve more than 150 million mobile subscribers by 2013. (Kin, 2010)

2.2. The Competition of the Standards:

Many government organizations involved in this mobile TV standard development. Such as the China National Standardization Administration (CNSA), the former National Development and Reform Commission (NDRC) now called the State Development and Reform Commission (SDRC), the former Ministry of information Industry (MII), since 2008 the Ministry of Industry

and Information Technology (MIIT), the State Administration of Radio, Film and Television (SARFT), and several enterprises. CNSA attempted to accommodate the interests of all concerned parties and it was a tough mission. The challenge was that the Mobile TV standard needed to be approved by all relevant government departments, however many of those supported a different standard. The competition reached the peak around 2006 when all of them along with their joint venture firms have invested/researched and reached the stage of field test preparation for the trials in the context of the 2008 Beijing Olympic Games. However, many were reluctant to invest further in the field tests, owing to the announcement that the national standard of mobile TV was not yet in place. They faced huge investment which was high risk. (Froggatt, 2010).

For all the competition standards, 2006 and 2007 were years of hypothesizing and gesturing (Wang, 2008a). Several factors were involved in the decision making during this period of time:

(1). Time Pressure: Beijing Olympic Games Opening Ceremony on August 8, 2008 was near; and a complete system was needed to broadcast the Games.

(2). Indigenous Technology and Intellectual Property Right (IPR)/Loyalty Fee: The huge number of mobile-phone subscribers in China resulted in several billions of U.S. dollar costs due to the loyalty fees of mobile-phones and mobile system equipments purchased abroad. Chinese government encouraged indigenous technology and domestic production. This specifically concerned the manufacturing capabilities of semiconductor chips for all needs. A similar test case of China's 3G mobile-phone standard TD-SCDMA was planned by MIIT during the Games. (Bloomberg, 2011).

(3).The competitor of Mobile TV standards' Technology availability and capabilities: China was to take the opportunity of the Olympic Games to introduce China to the world. Because 2/3 of the Chinese territory consists of mountains and deserts, the satellites broadcasting capability was preferred for coverage both locally and globally.

(4). The affordability factor (was it cheap enough?) for rural areas was seriously considered, for all the Chinese people should be able to watch the Games, the business model of the mobile TV business should be switched to encompass more than just profits.

(5). Authority for the ownership of the TV standard and benefit sharing: Whoever owns the IPR for the standard will be benefit from the market point of view. Equal share of benefits is the basic principle in China, but this only exists in idealized books, the competition among government departments

was very critical at that time (2006 to 2008) and there seemed to be no easy solution.

(6). China Central Television (CCTV) had been announced that it was granted the right to broadcast the Olympics Games worldwide and SARFT was their direct boss.

(7). China's social stabilization, social security and safety are the most important issues for the Chinese government, and the mobile TV standard will be needed to support the fully transparent policy for the broadcasting contents.

The winner of the competition for the standard will depend on gaining the most points from the 7 categories above.

The debate over mobile TV standards reached boiling point as SARFT announced a format that had been reportedly chosen as the national standard.

In August 2006, SARFT expressed that the Chinese government had asked SARFT to take a leading role in the development of the China mobile TV industry since it was a new form of media service. However, MII officials along with Chinese telecom operators said that they were not aware of any of such request. [ref]

On April 3, 2007, China's Standardization Administration (CSA) announced that following the evaluation tests, the T-MMB format, developed by Beijing Nufront Software Technology, was chosen as the national standard for mobile TV.

In September 2007, SARFT was even awarded licenses for mobile TV in six cities, including Shanghai Media Group and CCTV for trials, a decision that displeased the MII.

In the battle over mobile TV, SARFT had more controls over content while the MII's advantage was its connections with more than 500 million mobile phone users in China. (Wang, 2008a).

The central government itself has made no public announcement.

3. Theory and Methodology

3.1 Technical Definitions:

This paper referenced and followed the definitions mainly from: Many academic sources and organizations/ associations. For example: The final white paper entitled "Mobile TV: The Groundbreaking Dimension" by mobile

TV UMTSF/GSMA joint work group (UMTS, 2006); UMTS Form 2nd white paper “Sustainable Economics of Mobile TV Services” by Mobile TV joint UMTS Form/GSMA (UMTS, 2008). And UMTS Form. Mobile TV Joint UMTS Form Work Group. “Mobile TV Advertising”. 3rd white paper. (UMTS, 2009).

3.2.Data Gathering- Anonymous Interviews and Notes:

The author has worked in Beijing since March 2001. As head of the Beijing branch of a U.K. Information Technology company, he talked to many experts, operators, vendors and academics. There were relatively many articles and newspapers discussed and deep concern was expressed for the new Digital TV standards since 2003.

It was normal to take notes, but, these experts wished to remain anonymous fearing that if their names were exposed, they might be liable to charges, because restrictions are in place concerning leaking messages.

The notes covered approximately 120 interviews. Although these cannot be viewed as formal interviews, they were found highly valuable for this research. They would help filter the information and messages. For example: the information and messages which were obtained from newspapers, websites, telecom policy argument articles in Chinese magazines, would help decipher the propaganda from the real situations. The reference information listed should be reliable.

3.3. Actor-Network Theory

The Actor-Network Theory (ANT) will act as an important tool for the case study of the Mobile TV Standard. It is trying to investigate the process of translation, where actors align the interests of others with their own. ANT is a popular tool and has been used in many other fields such as: organizational analysis, information technology, health studies, geography analysis, human sociology, feminist problems, anthropology and economics. The Actor-Network Theory tries to explain how social-technology actors, within a network, come together as a whole body with different components. On the basis of the actor-network theory, these networks emphasize the performance of the actors, and their sustainability within the related networks, showing their relationship and transformations. (Shin, 2010).

ANT was first developed by Michel Callon, Bruno Latour and John Law in the early 1980s (Callon, 1986), (Latour 1987), (Law, 1986). It was an effective tool for describing the relationship between technology and society. This shows the process between technical and social mechanisms, including the government role while going through a decision making process, and covers negotiations preceding agreements. ANT explores technical

implementation in organizational settings, and socio-technological changes occurring in dynamic and global settings. The key component of ANT analysis is trying to investigate the process of translation, where potential actors aligned the interests of others with their own. In the case studies shown in this research, actors can be broadly categorized into three groups: the government departments were NDRC, MII, and SARFT and the operators were CSMBC, China Mobile, and CCTV. The potential actors among vendors were Huawei, Datang and several chips manufacturers, handset terminal manufactures as well as universities / academics and subscribers. They were all potential actors with very complicated relationships amongst them. The Beijing Organizing Committee for the Games of the XXIX Olympiad, (BOCOG) actually acted as the most important actor in the beginning. (Fan, 2006).

There will be four main steps for the translation. During the first step called Problematization the Primary Actor (PA) will emerge and the common goal for all actors is determined; it tries to establish itself as an Obligatory Passage Point (OPP) during this step, it means that the PA indeed becomes a central entity in the network. The second step is called Interessement; during the second step, the Primary Actor (PA) will try to get the other actors interested in the designed roles and the negotiation started. The third step is Enrollment; all actors accept the roles that have been defined for them during the previous steps by the Primary Actor. The Fourth step is Mobilization of Allies; the actors try to get support from the wider social environment for their course. The theory further assumes that the network is not stable and static, but it is re-established and reshaped continuously. It can also cease to exist for various reasons (Callon, eds. 1986).

3.4. The Translation Process of Actor Network Development around Mobile TV

3.4.1 The Non-Human Actors (Mobile TV standards):

The Actor–Network Theory (ANT) in this paper is used to describe the formation and diffusion of technical implementation for the Mobile TV services system. It is a new mobile TV standard; a complete industry chain will be needed to provide the technology-intensive services. Mainly it will include, but not exclude, R&D of the chips, the mature mobile TV support equipment manufacturers to the reliable terminal devices (handsets) providers and service providers etc. Therefore, the Government Planning/ Research parties/ Manufacturer of all equipments/ Evaluation group/ and Customer satisfaction were all part of the chain. Different resources were jointly required to tackle the complexity of the different technologies. These technological requirements formed the basic successful factors needed for these non-human actors (Akrich & Latour, 1992). These potential candidates for non-human

actors included the five so called local technology mobile TV standards described in paragraph 2.1 who were **DMB-TH, T-MMB, CMB and MBMS , CDMA and CMMA**. The seven evaluation areas for the candidates were described in paragraph 2.2. It is not only a technology competition case but a social-technology transformation case for the social security (information safety) which lifted the evaluation result.

3.4.2 The Primary Actor (BOCOG):

China tried for almost 20 years to win the bid to be host country for the Olympic Games along with its gradually opening up policies. On the evening of July 13, 2001, the author was walking along the Tiananmen Square and saw thousands of happy faces shouting and running on the street. The announcement of the 2008 Beijing Olympic Games was the trigger to form the 2008 Beijing Olympic Games Committee (BOCOG, the Beijing Organizing Committee for the Games of the XXIX Olympiad), the Beijing City mayor Liu Qi was appointed to be the head of the committee. The BOCOG was not only a task force team but was authorized to make all the decisions for the Games. All Chinese government departments should fully support BOCOG. The tasks of BOCOG included re-building of the old Beijing city, construction of all various types of new sports stadiums such as the huge iron-nest, all new transportation facilities expansion projects such as new subways, new airports, new buses as well as policies set forth for air pollution control, and the establishment of the security system. The latter consisting of safety information broadcasting, etc. Later opening ceremony broadcasting rights were granted to CCTV. This pressured SARFT to step forward, because the safety issue was obviously the responsibility of SARFT for the entire Games broadcasting. Since SARFT promoted the standard based on the technology of STImi named CMMA, the most serious problem was the availability of the semiconductor chips and equipments for the trial to demonstrate before and during the Games.

The BOCOG possessed the capability to organize all the resources to work together in the same direction and purpose, however all resources were controlled by different Ministries or by different governmental departments, manufacturers, etc...

3.5. Problematization:

The problematization means the Primary Actor (PA) called BOCOG will identify the problem and defines the identities and interests of other factors (all the resources should work together including different Ministries and different governmental departments, all the industry manufacturers, and telecom

operators etc...) should be consistent with its own interests. Hardware and software for the Games had to be in place and function properly before the opening ceremony of the Olympic Games started. The ceremony was supposed to be broadcasted globally. Various signal receivers for satellite broadcast and the coordination with Global TV reporters made BOCOG and CCTV recognize the complexity of the task. Not only was there an obligation to secure the safety of the broadcasting contents, but also a reliable and capable mobile TV system needed to be available.

It is very clear that the Chinese government is directing the industry chain to achieve the goals of developing its national self-innovation capabilities (indigenous); hence, any China self-developed standard will be considered first.

*The **common goal**: The same mission of Beijing Olympic Games- (country promotion and country safety as priority number one) for China is to have all people willingly working together and to follow the instruction of the Primary Actor -BOCOG. The development of the China mobile TV standard will be decided by satisfying the needs for the Beijing 2008 Olympic Games' broadcasting and then to carry the national broadcasting industry forward.*

Obligatory Passage Point (OPP):

The local five mobile TV standards were supported by different powerful governmental departments. That is why it was very difficult to distinguish which one was better than the others, it would be wise to rank their suitability based on the results of demonstration i.e. trials. BOCOG was running out of time and announced that the trial would open equally using all five local standards. The Obligatory Passage Point (OPP) then worked for the opportunity to win which was fully dependent on the different parties' achievements. Now the BOCOG renders itself indispensable by defining a process under BOCOG's control that must occur for all actors to agree; it is called an Obligatory Passage Point (OPP).

The opening trial made all parties agree to carry out the trial first, and the OPP achieved by the even opportunity afforded by these trials. The national mobile TV standard would be determined and decided by the outcomes of the trials.

The trials involved in the six Olympic cities would require a great deal of financial investment for the build-up of these trial networks, and the availability of terminals was a big question. Some of the standard's developers were in short of investor support. MII and China Mobile were busy on the simultaneous trial test for the TD-SCDMA mobile-phone networks; this influenced the trials of some mobile TV standards that MII and China

Mobile supported such as T-MMB and CDMA. CMB supported by Huawei was designed for WCDMA networks and would not be fully compatible with TD-SCDMA technology (Wang, 2008b).

3.6. Interessement:

In July 2007, CMMB was strongly supported by SARFT which carried out field trials in 6 Olympic cities, with the target being to provide mobile TV services together with satellite services during the Beijing Olympic Games. First CMMB terrestrial network was also tested in Shanghai; the immaturity of this system has been improved since. The enrolments have been pushed by the Olympic Games (Karamchedu, 2009b). The industry chain members for the CMMB standard have been more completely formed since the Olympic trials.

In 2008 the CMMB was considered as one of China's home-grown standard and defeated DMB-TH and CDMA, Because SARFT has strongly supported CMMB, the launch of the Beijing Olympic Games has rapidly developed the value chains and user base of CMMB related technology.

Other Mobile TV standards have been limited due to lack of support.

On the other side, the new China 3G standard of TD-SCDMA that China Mobile of MII in 2008 was operating was encouraged to expand and China Satellite Mobile Broadcasting Corporation (CSMBC) have jointly announced plans to launch TD-SCDMA-based 3G mobile communication services with CMMB mobile TV multimedia applications pre-installed. Vimicro and Leadcore have agreed to cooperate in developing 3G mobile phone technologies based on TD-SCDMA and multimedia standards for China Mobile (Hulme-Jones, 2011).

3.7 Enrolments:

With the technical supports of Vimicro and Leadcore, the State Administration of Radio Film and Television (SARFT) advanced the CMMB standard networks trials.

In 2007, Vimicro International Corporation (Vimicro), one of the local leading multimedia semiconductor and solution providers, Vimicro was a strategic development partnership with China Satellite Mobile Broadcasting Corporation (CSMBC), a subsidiary of SARFT, to advance the development of mobile TV relying on the CMMB standard. As part of the agreement, Vimicro developed highly reliable and highly integrated CMMB chip solutions, while CSMBC provided functions of support and assistance including CMMB handset testing and certification. Both companies have actively promoted the

CMMB standard and technology in the end user market. CSMBC invests in and operates domestic satellite mobile multimedia broadcasting projects, including CMMB, and is also responsible for system design, broadcast satellite technology development and signal transmission services.

On Aug 25, 2009, Vimicro announced a strategic collaboration agreement with Leadcore Technology Co., Ltd. (Leadcore), a subsidiary of Datang Telecom technology Holding Co., Ltd (Datang Holding) which pioneered the TD-SCDMA technology and standard. Leadcore is the worldwide leading TD-SCDMA User Equipment Solutions provider (Vimicro, 2009). Leadcore Technology Co., Ltd. is one of the core members of Datang Telecom Technology and Industry Group. As a provider of TD-SCDMA User Equipment technology, Leadcore has been dedicated to provide handset manufacturers and designers with leading TD-SCDMA User Equipment solutions and chipsets. The solutions have been adopted by key handset developers.

3.8 Mobilization of Allies

SARFT supports the CMMB standard after the governmental announcement of March 22, 2010. Vimicro has demonstrated its CMMB capability of chips and agreed it would provide comprehensive mobile multimedia technologies and solutions, including mobile TV technology. The industry chain actors will be able to pass through Vimicro to pursue their interests. And Leadcore of Datang has been dedicated to provide handset manufacturers and design houses with leading TD-SCDMA User Equipment solutions and chipsets. The solutions have been adopted by key handset developers.

The decision had finally been made that SARFT would be in charge of the China Mobile Multimedia Broadcasting (CMMB) standard as the national mobile TV standard, and formally launched on March 22, 2010. There were 303 cities, 6 channels, at an initial price of 6 Yuan (\$88 cents)/month and 845,000 CMMB capable handsets have been sold already. The Chinese State Council (CSC) called for a timetable of acceleration to speed up the compromised process for a mutual agreement between China Broadcast Corp. (CBC) of SARFT and the Telecom Operator China Mobile controlled by MIIT (Clark, 2010).

CSMBC (China Satellite Mobile Broadcasting Corporation) is the wholly-owned subsidiary of the State Administration of Radio, Film and Television. The company is responsible for the investment, operation, system design, radio satellite-related technology development and radio broadcasting services for China's satellite mobile multimedia satellite broadcasting projects.

CSMBC is now the national operator of the CMMB standard. The standard has been adapted for mobile TV broadcasting on small screen devices, such as 3G phones, PDAs, notebooks and smart phones. CMMB enables users to receive live TV programs and multimedia data on TD-SCDMA networks under an agreement which was signed by CSMBC and China Mobile.

On Sep 9, 2011, SARFT disclosed that the Chinese 12th Five-Year Plan (2011-2015) had called for direct-broadcast satellite (DBS) to reach 10 million households, in rural areas in 2011, which lacked cable TV access. The plan is to reach 50 million households in 2012, 100 million in 2013, 150 million in 2014, and 200 million by 2015(Prasad, 2011).

DBS trials began in rural areas of Ningxia, Inner Mongolia, and Hebei in April 2011. Users who purchased a receiver have free access to 25 TV channels and 17 radio stations. Subsidy is given on receiver purchases in each trial area. In Ningxia, each household receives a RMB 100 subsidy, while in Inner Mongolia users received RMB 200. (SARFT, 2011a), SARFT is responsible for the safety of the contents of any broadcasting in China including analog broadcasts.

4. Discussion:

CMMB (China Multimedia Mobile Broadcasting) was a Chinese mobile television and multimedia standard that was the first Chinese -developed system serving a variety of mobile terminals, such as mobile phones, PDAs, MP3/MP4 players, digital cameras and notebooks.

CMMB was the choice as it was supported by the SARFT who was the regulator and controller of (1). China central TV (CCTV) 12 channels (2). Management of all China TV stations including all provincial TV stations (China currently has no fully private TV stations) (3). All broadcasting contents are to be monitored and approved prior to their broadcast (4). Regulations and policy set for broadcast, and spectrum resources management, etc. SARFT possessed huge responsibilities and powers and requested they report directly to Chinese Communist Party (CCP) for any emergency events.

Why was SARFT in charge? In China, the “contents” of broadcasting is one of the most carefully handled issues. The concern is not without cause, for people will adopt and behave according to whatever they have learned by watching or listening. The contents that reached to multimedia channels such as telecom, broadcast television and internet networks would be monitored and approved by SARFT. For example, SARFT announced in January 2012 that the content of entertainment TV would be decreased by nearly 70%, new type of content increased by 1/3 including economics, culture, science, youth,

documentaries, etc. The new regulation for TV advertisement time is limited to 18 minutes from 7:00 P.M. to 9:00 P.M. (SARFT, 2011b)

It is a tough job for SARFT, for the new technology today can easily gain access or bypass your firewall systems and protections. This may be one of the reasons that Chinese government has announced the convergence of the three networks and it will be one of the emerging strategic industries for priority development and planned for completion by 2015. The trials of the integration for tri-network (TV, internet and telecom network) started in 2010 for these three networks. The management of the 1.3 billion populations in China is always a challenge; any country's growth should be based on a stable society.

Independent innovation (indigenous technology development) has become a top-priority policy of the Chinese government, and Mobile TV is therefore a path that must be followed. "Only success is acceptable, and no failure will be tolerated," from the perspective of the national strategy, a long term corporation structure needs to be secured.

Chinese local technology developers have the great opportunity, for the government policy is to encourage and support Chinese self-innovated technologies; Still any worldwide technical standard composed of many small modules which were originally developed by some companies that may still own the Intellectual Property Right (IPR) for the modules, will be interesting. And China needs to have an innovation system that puts greater emphasis on prizes and government funded research. A well designed innovation system is needed that consists of government financed research at universities, other research establishments, and specialized laboratories etc, This is because the innovation needs to be targeted at a broad range of social objectives.

Vimicro was a good example to show how government would support its policy. On June 8, 2010 at 41 years of age, the Founder and CEO of Vimicro International Corporation, Dr. John Zhonghan Deng, was officially awarded with the honors title of member of the Chinese Academy of Engineering. He is a life-long member of the Academy and it is the highest academic title for life honors in the field of engineering and technological sciences in China. Former President Hu Jintao was present and delivered the keynote speech. The election was based on his contribution of innovative ideas and products to the industry. Dr. Deng is the youngest member of the Academy.

The Five Year Plan conducted by Chinese government for their development paths. Former President Hu said several times in the 17th National Congress of the Communist Party of China on Oct 15, 2007: "Enhancing the ability of original innovation and building an

innovation-oriented country" lies at the core of China's development strategy and is the key to improving overall national strength. He also emphasized that the scientists should strengthen scientific research in fundamental, cutting-edge and generic technologies, and combine scientific and technological innovation with national economic and social development so as to offer science and technology support for China's building of an innovative country and adjustment to its economic growth mode. "Efforts should be made to boost scientific research and technical innovation, cultivate talent in high-tech fields, and enhance overseas cooperation in both technologies and investment." For the business of mobile TV, the development of distinct business models, appropriate content, available and affordable terminals and cooperation between telecom operators, broadcasters and regulatory bodies that this market could become keys for new markets in China. (Fung, 2011).

5. Conclusions:

In China, Mobile TV has become more important to generate new revenue for both telecom operators and broadcasters, but the technology advantages, business model and earnings will not be the only considered factors for the development of the mobile TV standard. The country's indigenous innovation capabilities/policies as well as China's society safety are also listed as a high priority when making decisions. The affordability for the rural area is another key factor for the decision making.

Chinese government has its own political, economic, social, and technological development guideline. President and General Secretary of the Communist Party of China (CPC) Hu Jintao pointed out in his report that development of Mobile TV in China was a good match for the country's policy and principle.

The decision making process of the Chinese government seemed very complicated, yet it was quite simple, it makes decisions by principles which are national security first, the indigenous development capability second, the economic development eventually third. therefore, the indigenous / independent innovation idea turns out to act as a country's operational principle; China was run by the government principles for example the 5 year plan, etc.

On March 14, 2011, China National People's Congress endorsed the nation's twelfth Five-Year Plan (from 2011 to 2015), it will be the top guide-line for the country's development and it has placed much more emphasis on three of the main priorities in this plan: "Sustainable Growth, Industrial Upgrading and the Promotion of Domestic Consumption".(Dickinson, 2011). All of the

three priorities will be aligned to support the development of the mobile TV business in China today, and the sustainable growth means "Scientific technologies and independent innovation capabilities." Chinese President Hu Jintao urged Chinese scientists to vigorously enhance the nation's capacity for scientific and technological innovation so as to seize the initiative in global competition. This background may explain why from this point on, China's mobile TV services, the broadcast sector, IP TV and mobile TV are also marked as hot spots in the next five years(Donews, 2011).

SARFT has submitted a new proposal to China State Council to establish a consolidated national cable TV operator "China Radio and Television Network" as a commercially-oriented state-owned enterprise (SOE) under State-owned Assets Supervision and Administration Commission (SASAC). The State Council rejected an earlier proposal that the "China Radio and Television Network" be made a government-funded entity. This indicated that the government still support and favors efforts on the market economic development. The content of Mobile TV will be closely monitored. The main reason is their concern for a safe society.

The authority power in China can be learnt from the following news: The Department of Publicity and Administration of SARFT said recently that regulations limiting the amount of entertainment programming on satellite TV channels will come into effect on January 1, 2012. SARFT recently issued "SARFT Guidelines for Strengthening Management of Satellite TV Programming," which calls for the establishment of a satellite TV programs broadcast and control system, specifically to curtail excessive entertainment programs during primetime hours (7PM to 10PM), and the commercial advertisement time limited to 18 minutes/hr during this period. The regulations state that satellite TV channels must primarily engage in TV news programming, and take steps to improve news gathering and broadcasting capabilities.(APCO, 2010).

Chinese State Council planned to combine China's General Administration of press and Publication (GAPP) and The State Administration of Radio, Film and television (SARFT) into one agency, and the new tasks will be (1) overall planning for the development of the press, publication, radio, film, and television industries, (2) oversight and management of news, print, broadcast, and film and television organizations and services, (3) the content and quality of publications, authorship rights management; the new agency report will come under the purview of the national Copyright Administration of the people's Republic of China (NCAC).(Sina Tech, 2013).

The new agency release in 2013 the "triple-play" network convergence plans for 2013-2015; the core goal is to achieve full digital conversion for all cable TV networks, and that cable internet access speeds should reach a

minimum of 30Mbps national wide by end of 2015, and 100mbps in some regions. (*Sohu IT*, 2013)

MIIT Announces 2012 China Telecom Statistics

Year	2009	2010	2011	2012
Mobile Subscribers (Mln)	747.21	859	986.25	1,112.16
YoY Change	N/A	14.96%	14.81%	12.77%
SMS Per Mobile Subscriber	1034.05	963.62	891.01	806.82
YoY Change	N/A	-6.81%	-7.54%	-9.45%
Mobile Internet Users (Mln)	233.44	302.74	355.58	419.97
YoY Change	N/A	29.69%	17.45%	18.11%

Source:

<http://www.marbridgeconsulting.com/marbrighedaily/2013-01-24/article/63049/>

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