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# The survival and development of connected TV in the context of three network convergence in China from 2008-2015

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**Abstract**

With the development of digital technology, network technology and terminal technology, three network convergence (or triple play, referring to the way the telecommunication network, the broadcasting network and the Internet converge and develop together, connecting the three networks and sharing their resources in providing Internet access, TV and telephone services) is becoming more and more apparent in China from 2008 onwards. Chinese government has released a full suite of policies to promote the development of triple play. And triple play brings lots of convergence opportunities to the broadcasting, telecommunication and Internet. What does television, as one of the most important media, to make good use of triple play and to have a better future is the starting point and the objective of this research. This thesis analyses technical developments, management, market demand and the government policies influence on the development of television in the context of triple play in China, from 2008 to 2015. And it takes China Network Television (CNTV) as the case study; summarizes plenty of experiences and deficiencies. Moreover, it suggests development lines for the survival and development of connected TV in the context of triple play in China.

The survival and development of connected TV in the context of triple play mainly involve contents and business, transmission channels, terminals and platforms and government supervision, etc. This research discuss questions such as, how to construct content and explore new business, how to develop transmission terminals and platforms, how to innovate management, how television can have a better development under the laws , the policies and the supervision of government. The suggestions included in the thesis to the survival and development of connected TV relate to the above four questions.

Keywords: triple play, television, convergence, China

**Resumen**

Con el desarrollo de la tecnología digital, la tecnología de las redes y la tecnología de los terminales, la convergencia de las tres redes (o *triple play*; se refiere a la forma en que la red de telecomunicaciones, la red de radiodifusión e Internet convergen y se desarrollan juntos, conectándose las tres redes y compartiendo sus recursos en la prestación de servicios de acceso a Internet, TV y teléfono) es cada vez más visible en China desde 2008. El gobierno chino ha lanzado un conjunto de políticas para promover el desarrollo del *triple play*. El *triple play* comporta una serie de oportunidades de convergencia a la radiodifusión, telecomunicaciones e Internet. ¿Qué hace la televisión, como uno de los medios más importantes, para hacer un buen uso del *triple play* y para tener un mejor futuro? Este es el punto de partida y el objetivo de esta investigación. Esta tesis analiza la influencia de los avances técnicos, la gestión, la demanda del mercado y la políticas gubernamentales en el desarrollo de la televisión en el contexto del *triple play* en China entre 2008 y 2015. Y toma China Network Television (CNTV) como caso de estudio y resume sus experiencias y deficiencias. Por otra parte, en la tesis se sugieren líneas de desarrollo para la supervivencia y el desarrollo de la televisión conectada en el contexto del *triple play* en China.

La supervivencia y el desarrollo de la televisión conectada en el contexto del *triple play* se refieren esencialmente a los contenidos y de negocios, canales de transmisión, terminales y plataformas, a la supervisión del gobierno, etc. En esta investigación se plantean, entre otras, las cuestiones siguientes: cómo construir contenido y explorar nuevos negocios, cómo desarrollar terminales y plataformas de transmisión, cómo innovar en la gestión, cómo la televisión puede tener un mejor desarrollo en virtud de las leyes, las políticas y la supervisión del gobierno. Las sugerencias que se proponen en la tesis para la supervivencia y el desarrollo de la televisión conectada hacen referencia a la cuatro cuestiones anteriores.

Palabras clave: triple play, televisión, convergencia, China

**Content**

# 1. Introduction

## 1.1 Research Background

Nowadays, three networks integration is regarded as kind of national strategy in China (Forward, 2014). The technology and knowledge intensive industries that the three networks integration covers broadcasting industry and TV industry, telecom industry and internet industry are basic and with huge productivity, provided they are well applied. They are important parts of China electronic information industry. The promotion of three networks integration plays a significant role in industrial structure adjustment and development of electronic information industry (Forward, 2014).

2008 is a big year for all kinds of media in China: Sichuan earthquake and Summer Olympic Games were the biggest events in China. In this year, the media developed most in Chinese history. In 2008, the State Council posted the notice "Several policies for encouraging the development of digital TV[1] industry" (www.people.com.cn); the ministry of science and State Administration of Radio, Film & Television (SARFT)[2] jointly signed the "Independent Innovation Cooperation Agreement of National High Performance Broadband Information Network & China's Next Generation Broadcast Networks" and proposed to build the next generation broadcasting television network (NGB) in 10 years (www.people.com.cn). Those two policy documents gave political support to triple play. In 2009, from the system to the business level, from telecommunication industry to broadcasting industry, triple play started developing rapidly. At the end of June 2010, triple play pilot city list (including 12 cities, see appendix 1) together with the pilot program were officially announced. Triple play has finally entered a substantive

[1] Digital TV and cable TV in China are two widely used forms of television. Both are State owned, but the users need to pay for receiving signal every month

[2] SARFT is an executive branch under the State Council of the People's Republic of China. Its main task is the administration and supervision of state-owned enterprises engaged in the television, radio and film industries.

stage (Zeng &Wu, 2012). Until now, there are more than 42 pilot cities (see appendix 1). For those reasons, this research starts from 2008.

Digital Broadcasting Network, Broadband Communications Network and Next Generation Internet are technically equipped with transmission of voice, data, audio and video features simultaneously that provides the Broadcasting Network not only with transmitting audio and video, but also with two-way data transfer and voice communication; that provides the Internet with transmission of data services, transmission of online audio and video and online communications at the same time. With the gradually propulsion of three network convergence in China, it is possible that Chinese broadcast television network and telecommunication network will have some similar characters. Broadcast television network starts doing telecommunication services and telecommunications network goes into the traditional broadcast and television business, this bi-directional in the future will be inevitable.

Furthermore, with the development of three major networks, a variety of new media are emerging based on digital broadcasting network, broadband communication network and the next generation Internet (Bao, 2010). In particular, many online video players are developing quickly with its completely different from the traditional mode of transmission of television. For example, based on the development of the Internet, video sharing website, portal network TV channels as well as a variety of video players (such as PPTV[3], Storm Codec[4]), and other online video programs are taking advantage of the Internet on the triple play and the development of the network video service; Internet Protocol television (IPTV) based on the development of cable broadband communication network, mobile TV based on the development of wireless mobile communication network, Internet television and other new television transmission platform based on the development of Mobile Internet (Zhao, 2011), these are all new transmission forms along with the development of the three major television network. From the history of communication, every change ~~was~~ in

[3] PPTV is the largest leading online TV service in China offering featured television shows, sports, entertainments, news and other popular video contents. (http://www.pptv.com/aboutus/en/)

[4] Storm Codec is a pack that brings together all the best codecs to play different types of video files well.(wikipedia)

communications technology in the past was accompanied by a new generation of media breaking the balance of the original media. Those original media and new media compete and learn from each other in this imbalance atmosphere trying to get a new balance. With the development of digital broadband and triple play, the balance of newspaper, broadcast, television and other traditional media is also broken (Cao, 2011). The difference of this time, the main character is merging texts and pictures in the newspaper, audio of broadcasting, audio and video of television all these forms together. From this perspective, the development of digital broadband network not only creates new media, but it also increases the number of traditional media broadband network communications channel.

At present, Television as the first media, what does traditional television do to make good use of three network convergence and to deal with different television media development environment facing with the trend of triple play, the new environment for television development, telecommunications sector of China trying to penetrate in traditional radio and television services and the impact of all kinds of online video players? These urgent and realistic problems are faced by Chinese Film Bureau, the television practitioners and television theorist (Wang, 2011), and also are the starting point and the objective of this paper.

The survival and development of connected TV in the context of three network convergence as the research object of this paper, is to explore how does television face opportunities and challenges brought by the triple play? How can it make good use of Digital Broadcasting Network, Broadband Communications Network and the Next Generation Internet? How does TV expand and innovate by using these three network forms and how does telecommunication infiltrate into TV industry? How can connected TV take full advantage of digital radio and television network, Broadband Communication Network (BCN), and next generation Internet these three major platform? How can television develop with multidimensional? For these problems, we will propose some strategic thinking of the development and survival of connected TV. If these problems are solved, television media will be on a pole position in the era of triple play and may seize the commanding heights of media development.

## 1.2 Theoretical Framework

Everyone in this society has needs, according to Maslow's hierarchy of needs, need to know (Maslow, 1954) is a part of them. The need to know means the need for understand himself, other people and the changing world. Nowadays, there are many ways to get information, for example books, newspapers, radio, and Internet etc. connected TV also is an important way too.

The Chinese Government first adopted the policy of three network convergence in the 10th Five-Year Plan (2001). According to Triple Play Policy Report 2011, this policy served diverse state goals, including the fulfillment of national strategic plan, advancement of communication industries, as well as development new operational business models and modern consumer services (Wu&Leung,2012). According to the 12th Five-Year Plan (2011), the government was trying to establish and perfect the laws and regulations, implement the convergence of telecommunication network, broadcasting network and Internet. The Chinese Government gives "triple play" the biggest policy support. In China the study of triple play mainly concentrated on the following aspects:

First, study on the development status and development trend of triple play, such as Ke (2010), which described the development situation of three network convergence, the supportive policy by Chinese Government and the expectations for the future. Bao (2010), did a description of the triple play situation of in the United States, the United Kingdom, France, Japan and China, an analysis of the interests of society brought by triple play and the effectiveness of broadcasting network, telecommunication network, equipment vendors and audiences;

Second, technology study of triple play, such as Zhao (2010), who discusses the current motivation and conditions of the three network convergence in China, making it clear that the core of the triple play is the construction of broadband and analyze the development difficulties of triple play; Cao (2011) remarks that the improvement of technology provides a possibility with the spread of triple play, and the author analyze and summarize developing trend of the triple play in China;

Third, research on content, operation and management of triple play, such as Huang (2011) remarks that the dominant force of pushing triple play moving forward is the audiences' needs, from the aspect of operation and management, the author put forward some suggestion for the development of triple play; For Li (2011), triple play shapes a new pattern of media. Under such a pattern, a new value chain will form, which will put forward new requirements to media production and management.

The above researches are mostly centered on studying the problem from the perspective of triple play of its own, combining triple play and the development of television media and discussing the problems of the development of TV media in the era of triple play, except for Zhou (2011) and Wu (2010), Zhou remarks that in the context of triple play, there are clashes and conflict between Broadcasting network and communication network, he analyzes how the broadcasting network will cope with the conflict; Wu (2010) remarks that Washu media group[5] has been a huge success in digital TV in Zhengjiang Provence who gives other Chinese media company some suggestions to develop. These articles don't offer a comprehensive grasp of television in the context of triple play. The width and depth of the research needs to be further improved. From the point of depth, these articles mainly focus on television media achieving diversification development by using Internet. But don't have a comprehensive investigation in how can TV network and Internet merge. Look from the width, TV media using three networks are mainly focused on the study of the wired Internet, not discussing television media using the three major network to open up new communication platform from an overall perspective.

Some of the researches on the development of triple play and television media mentioned before, have no specific research interest on television development issue in the context of triple play, and some are not using the premise of a comprehensive look at television media and how to use the three major networks to develop.

[5] WASU media group is a state owned new media and network industry group in Zhejiang province, China

## 1.3 Research Methods

First, literature analysis. From the point of view of social communication, literature analysis will opportunities and challenges that video is facing in the context of triple play in China;

Second, cases and examples analysis. Taking Chinese Network Television(CNTV)[6] as an example, we will describe how China Central Television(CCTV)[7] developed through the platform of CNTV. Starting with the CNTV's development process and practice, to sum up the network survival and development's experiences and shortages and give some other Chinese television media group or company some suggestions.

[6] China Network Television (CNTV) is an internet-based State-owned broadcaster of China Central Television launched on 28 December 2009 and offers six foreign languages services, including English, French, Spanish, Russian, Korean and Arabic. (Wikipedia)

[7] China Central Television or Chinese Central Television, commonly abbreviated as CCTV, is the predominant state television broadcaster in mainland China. CCTV has a network of 45 channels broadcasting different programs. (http://cctvenchiridion.cctv.com/ysjs/index.shtml)

## 2 Challenges and Opportunities of television in the era of three network convergence in China from 2008-2014

### 2.1 The notion, current situation and developing trends of three network convergence

#### 2.1.1 The concept of three network convergence

Three network convergence, known as “triple play," refers to the concept that through the technological transformation of three networks, including telecommunications network, computer network and radio and television network, to provide integrated multimedia communication services including voice, data, video etc (Zeng & Wu, 2012). Until 2014, in China, three network convergence does not mean that telecommunications network, computer network and radio and television network will merge in a physical way, but refers to the convergence of these three network in the information transmission and in business(Fu, 2010) (image 1). In other words, we can watch TV and surf the Internet through phones, we can use computer to make phone calls and watch TV and the television can make phone calls and surf the Internet. (Sun, 2013)

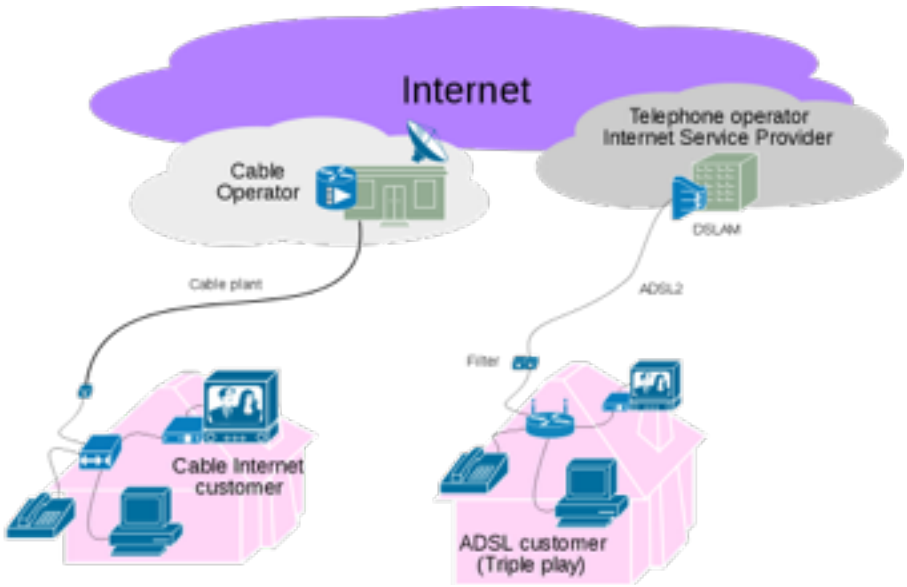


image 1: Connectivity for triple play customers over ADSL and CATV networks. (image by Ludovic.ferre http://en.academic.ru/pictures/enwiki/73/Internet_Connectivity_Triple-Play.svg )

### 2.1.2 The current situation and developing trends of three network convergence and terminal convergence

#### 2.1.2.1 The current situation and developing trends of three network convergence

First, we must consider the situation and developing trends of broadcasting network in three network convergence. Due to the particularity of the supervision system and industry[8], Chinese broadcast network presents a kind of massive structure, forming four different levels of overlapping coverage of network which are national broadcast network, provincial broadcast network, municipal broadcast network and county and municipal broadcast network.(Li, Liu&Chen, 2013) Until now, there is no forming a unified national broadcasting network operator and the main mode of transmission is one-way, real-time and one point-to-multipoint. Moreover, the digital level is not high also and there is a great distance from the requirement of three network convergence.

The development trends of the broadcasting network in China depend on the Next Generation Broadcasting Network of China(NGB)[9] which is still under construction. NGB is a broadband digital information network based on "3Tnet[10]" that is self-

[8] The State Administration of Radio Film and Television of China(SARFT) is burdened with the heavy task of supervising the national TV programs, Internet A/V programs, new media A/V programs and national radio programs. Such supervisory tasks involve a multitude of service systems and heavy data load whose uniform management is difficult. It is technically difficult to integrate these service systems and realize data storage, management and sharing. A solution not only relates to the storage and management of big data of the SARFT, but also will arouse new technical renovations in the radio and TV industry.(The State Administration of Radio Film and Television of China Released Value of Massive Data via Inspur's Leading Storage Technologies,16/09.2014)

[9] Next Generation Broadcasting Network of China（NGB）is a next generation broadcasting network constructed on the basis of achievements of cable television digitization and mobile multimedia broadcasting and with support of its innovative core technology of "high performance broadband information network" as well as applicable for our national conditions, integrated "triple-play," combining wired with wireless mode and with network on the whole journey. (NGB next generation radio and television network business, http://www.srtvn.com/en/content/ngb-next-generation-radio-and-television-network-business)

[10] 3TNet is a public network infrastructure now available in many regions of China that offers homes not only high speed Internet connections but also access to sponsored services like video phones and educational programs. (http://www.evolutionbb.com/cable/Bandwidth-Calculator/page411.html)

development of China and has Internet feature. The next generation broadcasting network can reach trillions of bits per second in the future, ten times faster than now (Independent Innovation Cooperation Agreement of National High Performance Broadband Information Network&China's Next Generation Broadcast Networks, 2010). The construction of NGB, as Wang Xiaojie[11] said, will help Chinese broadcasting network to change in four aspects: " the transition from small network to large network; from analog to digital; from unidirectional to bidirectional and from watching TV to using TV." With the upgrade and construction of the next generation of digital broadcasting network, broadband and bidirectional, there are great significance to improving the business hosting and support capabilities to meet with the development of triple play.

Second, the present situation and development trends of telecommunication network in three network convergence

Telecommunication in China has built a nationwide (including wired and wireless) network and its mode of transmission is bidirectional, point to point and realtime. But the use of optical fiber communication is not very common in China and the application of 4G mobile communication either. Currently, the construction of optical fiber wired communication network represents the development direction of wired network (Xia, 2011). Its features, such as high bandwidth, high quality, high speed, high security and low cost, just meet the development requirements of triple play. And it provides enough bearing capacity to carry out data, audio, video and other services. In addition, the fourth generation mobile communication network based in China with independent intellectual property rights developed with TD-LTE[12], is still

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[11] Wang Xiaojie: director of department of Science and Technology of SARFT(State Administration of Radio, Film and Television) http://www.ccbn.cn/en/channels/73.html

[12]TD-LTE is an evolution path for TD-SCDMA, which is China's 3G standard. China Mobile was the first operator to drive TD-LTE and now the technology has gained a global momentum with strong traction towards TDD spectrum. TD-LTE is a future proof technology with strong industry support from NGMN(Next Generation Mobile Network ), LSTI(LTE SAE Trail Initiative) and Terminal, Chipset and infrastructure vendors. TD-SCDMA and TD-LTE are the global 3G and LTE standards while the combination of TD-LTE and LTE FDD serves to be the basic foundation for the internalization of TDD.(Nokia Siemens Network TD-LTE white paper, http://www.mforum.ru/arc/20110319_NSN_TD-LTE_WhitePaper_MForum.pdf)

going on a popularizing period and represents the development direction of Chinese mobile communication network. “Compared with the TD SCDMA of 3G network, the TD-LTE has a big improvement in bandwidth, network latency and mobility” (Wu&Wu, 2011, 62). Along with the large-scale construction of optical fiber communication network(it was proposed by Chinese Government on 2002 and it is a part of “HIGH-TECH Olympic), the development and application of 4G wireless mobile communication network will greatly improve the process of three network convergence.

Third, the present situation and development trends of Internet in three network convergence

Internet has expanded most quickly and it is the most mature among the three network (broadcasting network, telecommunication network and Internet). The development situation of Internet basically meets the requirement of the development of three network convergence now. Internet using the Transmission Control Protocol (TCP)[13] model makes the Internet structure simpler, but the IP address[14] is trending is shorting. Based on IPv6[15] technology, the research and development of a new generation of Internet represents the developing trend of Internet.

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[13]Transmission control protocol (TCP) is one of the main protocols in TCP/IP (transmission control protocol/ Internet protocol), the suite of communications protocols that is used to connect hosts on the Internet and on most other computer networks as well. TCP is a connection-oriented protocol, which means that it establishes and maintains a virtual connection between hosts until such time as the message or messages to be exchanged by the application programs running on them have been exchanged. It divides any message to be transmitted into packets, numbers them, and then forwards them individually to the IP program layer. Although each packet has the same destination IP address, it may get routed differently through the network. (TCP definition, http://www.linfo.org/tcp.html)

[14] IP stands for Internet Protocol, so an IP address is an Internet Protocol address. An Internet Protocol is a set of rules that govern Internet activity and facilitate completion of a variety of actions on the World Wide Web. Therefore an Internet Protocol address is part of the systematically laid out interconnected grid that governs online communication by identifying both initiating devices and various Internet destinations, thereby making two-way communication possible.(http://whatismyipaddress.com/ip-address)

[15] Internet Protocol version 6 (IPv6) is the most recent version of the Internet Protocol (IP), the communications protocol that provides an identification and location system for computers on networks and routes traffic across the Internet. IPv6 was developed by the Internet Engineering Task Force (IETF) to deal with the long-anticipated problem of IPv4 address exhaustion. IPv6 is intended to replace IPv4.

The new generation of Internet advances towards optical fiber and broadband on the basis of existing digital and bi-direction. As the next generation Internet develops via, optical fiber, broadband, business diversification and high quality service, not only Internet data transmission business get faster developed, but transmission high definition digital TV programs and high definition video-calls through Internet will become normal (Research Center of State Press and Publication Administration, 2014).

#### 2.1.2.2 The current situation and development trend of the convergence of terminals

The convergence of terminals is an important aspect of triple play. Three network convergence first reflect on the convergence of terminals that is because on the control of the two-way access for telecommunications and broadcasting is much stricter than terminal manufactures and the convergence of network requires more technology and capital than terminal manufactures (Huang &Liu, 2011). 3G mobile phones, computers, mobile multimedia, digital TV, Internet TV etc are all typical representative of integration on terminal which can realize many services on one terminal, such as voice, television, Internet and so on. In the other word, this is " three with one terminal" or "one terminal is multi-purpose". Further more, with the improvement of terminal technology, there is a great progress and integration between different terminals what can share contents and services. This is becoming a trend.

At present, the development and application of mobile multimedia system, Internet TV, smart phone, tablets and other terminal represents the development direction of the terminal integration. Strengthen the integration of function of terminal and the compatibility between terminals is the trend of next generation of terminals (Li, 2014).

#### 2.1.2.3 The situation and development trend of the convergence of business

Business integration is the core of the three network convergence, the integration of network and terminal is ultimately in order to integrate in business and to make full use of network resources and terminal resources. In China, according to the plan "to

promote the overall program triple play by the State Council", which "Eligible broadcasting companies can operate value-added telecommunications services, Internet access service provided by wired networks, Internet data transmission business, IP telephone business. IPTV and mobile TV are controlled by radio and television department, guided by propaganda department. Qualified state-owned telecom enterprises under the supervision of the relevant department can produce radio and television programs except political topics, can transmit program signal of online video and audio, can relay programs of political new, videos and audios, can provide other public Internet audio-visual program service, IPTV transmission service and mobile TV distribution services". This plan showed that triple play in China in 2010 was still in the initial stage. Broadcasting network expanding its business into telecommunication network just finished the process of pilot, telecommunication can only produce a part of the broadcasting programs and provides broadcasting department transmitting signal and relaying services (Jing, 2011).

Business integration between broadcasting and telecommunications is the trend of the times in China (Liu&Wang, 2012). Two way access for telecommunications and broadcasting is the requirement of triple play and also the requirement of the development of the information industry. To accelerate the integration process of broadcasting and telecommunication, there is a need to adjust and modify relevant laws and policies that can guarantee the business integration. Adapting to the requirements of triple play business system is the domestic focus on direction of triple play in business ("Broadband China" strategy and implementation program, 2012(23)).

## 2.2 Challenges and Opportunities of television in the context of three network convergence

### 2.2.1 Challenges of television in the context of three network convergence

First, the challenge of television from the angle of three network convergence

As digital broadcasting network, broadband network and next generation of Internet develop, one network can will be able to provide services as three different networks business at the same time, for example: voice, audio and video, data and other services. Those three network business interpenetrated with one another, deepen with two-way access. If current policy allows telecommunication industry expanding its business into television business to transmit video programs through communication network and the Internet which belongs to broadcasting network's.

For example, telecommunication industry develops Internet Protocol television (IPTV) through the development of broadband cable network, and develops mobile TV through the wireless mobile communication network. The development of IPTV and mobile TV are the result of telecommunication network using the opportunity of triple play to penetrate to the field of television. And, Internet video-sharing sites, the television channel of portal sites, playing terminal of video software (such as PPTV, PPlive, PPs) and mobile video programs based on the development of mobile Internet are all the embodiments of using the Internet to develop network video business. Television only belonged to broadcasting business before, with the development of triple play, telecommunication industry and Internet industry want to penetrate into broadcasting business. Telecommunication and Internet industry want to make full use of their own network resources to break into television industry (Chen,2011), seek new business growth point and new development space. Telecommunication industry entered to the field of television business and that gave television industry a heavy pressure. In front of these trends and the development of triple play, television industry for the first time felt a threat to the survival. Also, telecommunication's permeability to television break the balance of television industry and exacerbating the competition among television industry[16] (Lin, Li &Zhao, 2015) .It is no doubt that it constitutes a great challenge for television industry.

[16] Before triple play there is just Broadcasting Network dedicating in the television business in China. With the development of triple play, telecommunication network try to enter into the television business. This situation for broadcasting network is a heavy pressure and have a formidable competitor.

Second, challenges to Television industry from the perspective of the use of video online

In 2007, Vint Cerf who is recognized as one of " the fathers of the Internet" predicted that the development of Internet would continue, and that we would soon be watching the majority of our television through the Internet—a revolution that could herald the death of the traditional broadcast TV channels in favor of new interactive services. Thus it can be seen that many videos transmission through network (including wired video online and mobile video) pose more and more severe challenges to the traditional TV.

"Up to December 31, 2014, the number of Chinese Internet users reached 648.75 million, among them there was 77.4% using broadband, online video users reached 433 million, with an increase of 4.78 million compared to the end of the year 2013; usage rate of online video was 66.7%, 2.6% lower than at the end of 2013, but the number of users increased 4.78 million" (China Internet Network Information Center(CNNIC),2015)(see Table 1).

| | 2014 | | 2013 | | |
|---|---|---|---|---|---|
| Applications | Number of users (10,000) | Utilization ratio | Number of users (10,000) | Utilization ratio | Annual growth rate |
| Instant messaging | 58776 | 90.6% | 53215 | 86.2% | 10.4% |
| Search engine | 52223 | 80.5% | 48966 | 79.3% | 6.7% |
| Online news | 51894 | 80.0% | 49132 | 79.6% | 5.6% |
| Online music | 47807 | 73.7% | 45312 | 73.4% | 5.5% |
| Online video | 43298 | 66.7% | 42820 | 69.3% | 1.1% |
| Online games | 36585 | 56.4% | 33803 | 54.7% | 8.2% |
| Online shopping | 36142 | 55.7% | 30189 | 48.9% | 19.7% |
| Online payment | 30431 | 46.9% | 26020 | 42.1% | 17.0% |
| Online literature | 29385 | 45.3% | 27441 | 44.4% | 7.1% |
| Online banking | 28214 | 43.5% | 25006 | 40.5% | 12.8% |
| E-mail | 25178 | 38.8% | 25921 | 42.0% | -2.9% |
| Microblog | 24884 | 38.4% | 28078 | 45.5% | -11.4% |
| Travel booking | 22173 | 34.2% | 18077 | 29.3% | 22.7% |
| Group purchase | 17267 | 26.6% | 14067 | 22.8% | 22.7% |
| Forum/bbs | 12908 | 19.9% | 12046 | 19.5% | 7.2% |
| Blog | 10896 | 16.8% | 8770 | 14.2% | 24.2% |
| Internet wealth management | 7849 | 12.1% | - | - | - |

table 1: utilization ration of Internet applications by Chinese netizens in 2013 and 2014(source by China Internet Network Information Center(CNNIC),2015)

With the development of new technology and triple play improve network video service in China, online video has become to one of the most important way for people to get their movies, TV programs, videos and data. “Since 2004, online video came into China. In these ten years, many venture capital entered in this field and online video industry has developed rapidly and is going to mature and becoming one of the main application of leisure entertainment. Currently, industry structure of online video has stabilized and “industry players” are seeking new breakthroughs in business models” (China Internet Network Information Center(CNNIC),2015). The number of television audiences is continuing reducing[17] and the number of network

[17] According to 22/10/2013 news from Xinhua News Agency, Young people are reducing reliance on TV amid television’s influence are continue falling, Until 2013, the rate of home using TV had falling from 70% of 2009 to 30% of 2013, the watching time of the audience from 15 years old to 34 years old is continuously falling.

video users is continuing increasing(see table 1). The audiences spend less time on watching traditional television, but more on online video. It is a great impact to TV commercials that traditional TV lived on in China[18]. But it is a great chance to online video advertising. " The fourth quarter of 2014, online video advertising reached 5.27 billion yuanes (enfodesk, 2015). See image 2.

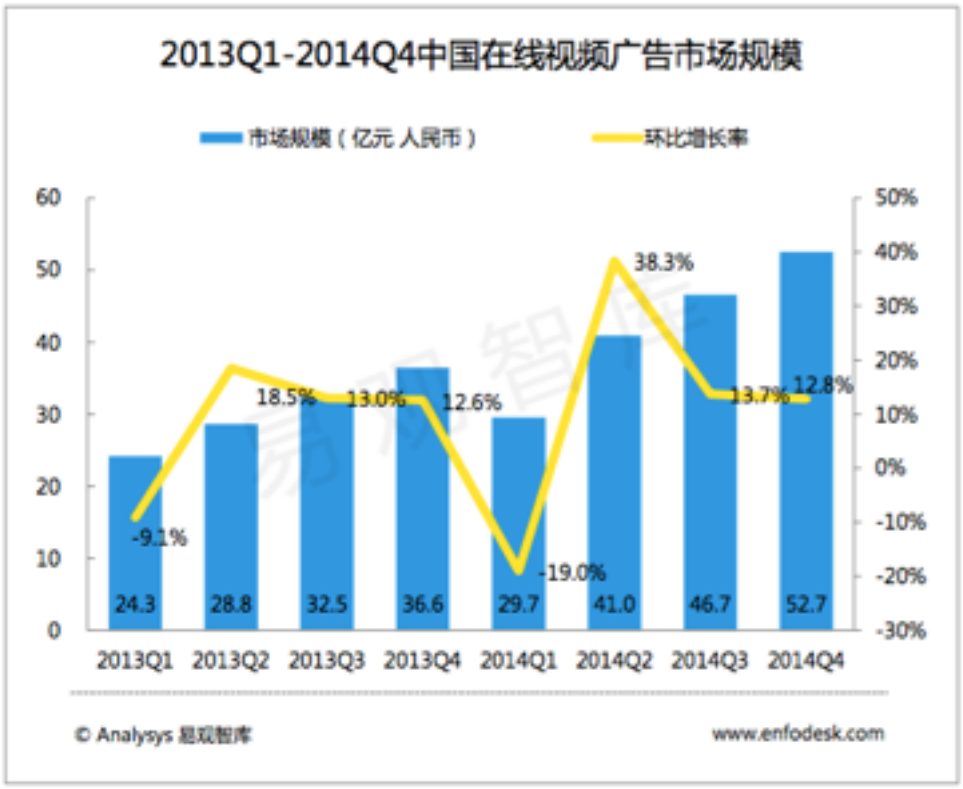


Image 2:

Chinese online video advertising market scale from 2013Q1-2014Q4. (Blue bar chart represents market scale (100million yuanes), the yellow line represents growth rate) (source by Analysys, www.enfodesk.com)

According to these survey data, the rapid development of network video constantly swallowed the audiences and advertising share that originally belong to the

[18] In China, tradition Television station has two part of incomes: one is financial allocation and the other is from TV commercials. Because Chinese Television Station is half public and half enterprise. Financial allocation is just a small part of their income, so the incomes form TV commercial is much more important than financial allocation.

traditional TV. Traditional TV audiences and video advertising share are gradually flowing to online video that is a great challenge to traditional TV.

### 2.2.2 Opportunities of television in the context of three network convergence

#### 2.2.2.1 television's opportunity from the perspective of the next generation of broadcasting network

Faced with the development trend of triple play, the State Administration of Radio, Film and Television of China (SARFT) should strengthen the construction of a comprehensive strategic of next-generation broadcasting to meet the requirement of triple play (Tian Jin, 2015). The construction of next generation broadcasting is mean to achieve the digitization, two-way and broadband network, to improve its technical support and the bearing capacity of the business that makes the technology system, business system and management system of network to adapt to the demands of the development three network convergence and to provide the foundation for the simultaneous transmission of voice, audio, video, data and other services (Bao, 2010). In this sense, the construction of next generation broadcasting is the basis and prerequisite of achieving three network convergence. Its aim is to enable broadcasting network to better meet the requirement of triple play and the digital age and be prepare to merge together with telecommunication network and Internet (Research Group of Media Research Center of Xinhua News Agency, 2010).

The construction of next generation broadcast network provides television a rare opportunity for development, momentum of development and a lot of room to grow.

1. Because of next generation broadcasting network, television can change drastically in the production and dissemination of television programs and enhance dissemination capacity of television. Carrying out video services in the context of next generation broadcasting network that makes traditional playing pattern change from "I see you play" to "my TV, I decide"; from point to side area transmission mode to point to point mode; from linear system to nonlinear system; from real-time dissemination to real-time and non-real-time. The change of propagation mode is revolutionary and completely subvert the traditional

transmission mode of television which make television more humanity, more to meet the individual needs of the audience. Television changes in production and propagation mode inject fresh air and makes television more attractive to the audiences. In this way, television is possible to show vigor again(Zeng, 2010).

2. Next generation broadcasting network has characters with such as broadband and high-capacity, which enable television industry to develop some new business, for example online games, e-business, value-added services and so on. In this context, television would pass from providing a single video service to a more diversified business development pattern (Nie, 2014).

3. With the completion of the next generation broadcasting network, television will have the technical supporting for using cable television, digital TV, etc to penetrate to telecommunication and Internet business, to voice communication and the Internet data access service. Let video, voice, data and other services carry out on the same broadcasting network, expand their business scope and make full use of broadcasting network resources. With the implementation of national policy of triple play[19], the television has been admitted to the telecommunication, Internet business service pilot, which makes television ushered in the development of diverse era. From this point of view, the construction of the next generation of broadcasting network provides a new development stage and development space for television (NGB Committee of Experts, 2010)

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[19] In 2001, the first came up with triple play at the Tenth Five-Year Plan officially. In January 1, 2008, the State Council reposted the notice—"Several Policies for Encouraging The Development of Digital TV Industry" (SCS [2008] 1) . (Zeng&Wu 2012)

In December 4, 2008, the Ministry of Science and SARFT jointly signed the "Independent Innovation Cooperation Agreement of National High Performance Broadband Information Network & China's Next Generation Broadcast Networks" and proposed to build the next generation broadcasting television network (NGB) in 10 years. (Zeng&Wu, 2012)

In January 13, 2010, the State Council executive conference clearly decided to accelerate the process of triple play, and clarified the timetable. (Zeng&Wu, 2012)

#### 2.2.2.2 television's opportunity from the perspective of television using telecommunication network and Internet

The development of triple play, telecommunication network and Internet provides new communication channels and communication platform for carrying out programs for television service through telecommunication network and Internet that can effectively improve the traditional television transmission and coverage, so as to improve the influence of television transmission.

First, Opportunities for television brought by telecommunication network

With the construction and development of telecommunication network, and it can provide all the services of telecommunication network, broadcasting network and Internet. Television under the support of national policy and in cooperation with the telecommunication sector carries out related online video services on telecommunication network. The development of IPTV (Internet Protocol TV) based on wired communication network and the development of mobile TV based on wireless mobile communication network are the typical form of cooperation between television and telecommunication cooperation.

ITU-T defines IPTV as multimedia services such as television/video/audio/text/ graphics/data delivered over IP-based networks managed to support the required level of quality of service (QoS)[20]/ quality of experience (QoE)[21], security, interactivity and reliability. "Television, audio and data" services of IPTV merge all of the three major network's business and reflect the trend of network convergence. Television media should actively strengthen cooperation with telecom, grasp the great opportunity for the development of IPTV which makes IPTV become another important television transport channel.

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[20] QoS is the monitoring of the discreet infrastructure components such as servers, routers, or network traffic (IP packets, transport stream, etc).

[21] QoE performance indicators are user-centric: Time to download a webpage or access an application, place a phone call, change TV channel, log into an interactive service, and measuring video & audio quality (MOS).

Mobile TV is a new form of television communication in the context of the development of wireless mobile communication network. In other words, mobile TV is the use of smartphones to watch TV programs. Before triple play, television programs only can be seen at a settle place, for example at home, work place, public place, etc. With the development of three network convergence, television programs can be seen at many terminals, not only at TV set, such as mobile phones, computers, tablet, etc. Mobile TV includes pay TV service delivered via mobile phone networks or received free-to-air via terrestrial television. The use of cellular mobile network to spread of TV programs is the perfect combination of telecommunication. With the construction of 3G, 4G wireless mobile communication network, technology breakthrough of mobile TV receiving terminal and the drop in price of smartphone are great chance and opportunity for mobile TV. Traditional Television is the major platform of video transmission, with the development of triple play, mobile TV is an inevitable choice for the video transmission (Zuo&Zheng, 2013).

Second, Opportunities for television brought by Internet

With the development of next generation Internet (including wired Internet and mobile Internet), technically all of the major services of broadcasting network, communication network and Internet can spread. Television can make full use of the Internet and carry out related television services over the Internet. For example, with broadband, large capacity and high speed, there are some major forms of the Internet's cooperation with television: to set up a network broadcast application and online TV station, mobile Internet TV station, etc.

TV website, including mobile Internet TV websites and Internet TV websites, is relying on traditional television which is one form of television convergence with Internet in the context of triple play. Similar to portal sites, television website embody text, audio, graphics, video, etc that makes television website can transmit online graphic and online video which combines the functions of traditional media(press, radio, television,etc) together. In this way, Internet content can be updated timely and can webcast and interactive. Television website is a new transmission channel for

television and will become a network media relatively independent from TV station. While at the service of TV station, according to the characteristics of the Internet, construct a TV website adapting to the spread characteristic of the Internet.

Network TV station, including mobile Internet TV station and cable Internet TV website, based on the video resources of traditional television to establish a television broadcaster on the Internet. This is a form of TV station using Internet in the context of triple play and also a kind of network media. Different with TV websites, network TV station takes network video transmission as the principal thing. If we say that traditional TV station is the broadcaster based on broadcasting network, while network TV station is the broadcaster based on the Internet. Network TV station not only has the characteristics of television media, but also the Internet's. Compared with traditional television, network TV station is a great extension of traditional television transmission capacity.

## 3 The development and where will television go in the context of three network convergence

### 3.1 Definition of concept of "survival and development of connected TV”

“Survival and development of connected TV” includes “survival and development,” “television” and “connected TV” three aspects. “Survival and development,” simply speaking, is one thing in a particular circumstance through a certain means and way to obtain sustainable development opportunities in China (Shen, 2007). For television that is the survival and development of connected TV in the face of triple play. Triple play and coming to digital age is a specific environment faced by current television and presents a serious challenge to television. Facing with the new situation, television cannot court self-destruction and wait passively for its demise, but need to consider how will television develop under the new conditions of three different kinds of network.

“Network,” with regard to this thesis, refers to the digital broadcasting network, telecommunication network and next generation Internet these three channels of information dissemination in China. The establishing of three networks is based on digital technology, broadband technology and network technology and has a certain common character. Meanwhile, the three networks after all are not the same networks and there are some technical differences. Digital broadcasting network, broadband network and next generation Internet, each one of these three network has some unique features difference from the other two.

"TV" here refers to the traditional TV media, in other words is the main carrier of information institutions for transmitting television programs. The transmission of traditional TV media is one-way, point to side which is essentially different with the digital broadcast television network, telecommunication network and next generation Internet on the three network transmission of digital TV, mobile digital media[22], IPTV, mobile TV, TV station site and network television.

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[22] Mobile media definition comprise media organizations from the print, broadcasting, recorded music, film a d Internet industries. (Dr. Valerie Feldmann, Mckinsey& Company, 2005)

Synthesizes the above analyses, the definition of “survival and development of connected TV” is as follow: survival and development of connected TV refers to the traditional television propagating information through digital broadcasting network, telecommunication network and next generation network in the context of triple play, expanding business scope, getting more development opportunities and winning the sustainable development and a new concept and transmission mode that is different from traditional television (Ding&Xu, 2013).

### 3.2 Route selection of "survival and development of connected TV"

According to the different networks which television programs are transmitted by, we can divide “survival and development of connected TV” into three types: based on digital broadcasting network; based on telecommunication network and based on Internet (Yi, 2010).

In particular, television can do the route selection from broadcasting network, telecommunication network and Internet in the context of triple play.

First, to speed up the construction of broadcasting network, to develop various value-added services and to integrate into the construction of broadcasting network, telecommunication network and next generation of Internet are the basis and precondition for achieving triple play. Only in this way, the broadcasting network can carry out various kinds of value-added services and can penetrate its business into telecommunication network and Internet.

According to Report of the study on the development strategy of independent innovation of China’s next generation broadcasting network, we can find that the State Administration of Radio, Film and Television (SARFT) supports to construct the next generation of Internet, promotes broadcasting network’s digitalized, networked and bidirectional and improves the bearing and support capacities of broadcasting network’s business (NGB Committee of Experts, 2010).

Because the next generation broadcasting network is based on 3TNet technology with the character of high broad-width, large-capacity and high-speed. Television can

make full use of its own net resources to carry out higher quality and more humanity television programs transmission services. As well as the policy of State to triple play, two-way access of broadcasting network and telecommunication network are increasingly clear, television media can support services of transmission voice, access to the Internet by using broadcasting network (Yi, 2010). In addition, the construction of digital terrestrial television and digital satellite television create the conditions for digital car TV and mobile multimedia television. These are the route selections of television on broadcasting network.

Second, to grasp the State's policy of triple play and broadcasting network should cooperate with telecommunication network on television services

The construction of optical fiber communications and the construction and application of 3G&4G mobile communication network which are promoted by Chinese government under the "Broadband China" strategy and implementation program, 2012 Plan (Sino market research, 2015(3)) not only provide the opportunity to make good use of triple play for telecom operator and mobile operator network condition, but also provide a new path selection for the television media using the telecommunication network to carry out related television business[23].

At present, China telecom and other telecommunications operators are massively upgrading their wired communication networks, 3G mobile communication network has fully covered the whole China (See Image 3) and 4G has covered the most regions of China (See Image 4). The development of telecommunication networks provides sufficient bandwidth to operate video service that makes the telecommunication sector change from "communication" sector to "communication—media" sector. Telecommunication network has a great development from 1G to 4G. At 1G era, communication network means the first generation of mobile communication system, in other words, that is Advanced Mobile Phone Service and started using from 1983 remained until 2008. It just had the function with voice; 2G—

[23] China network television industry market's present situation and the investment prospect forecast from 2013 to 2018, http://www.gtdcbgw.com/newsInfo.php?id=14606 , 2013

second generation of communication system with functions “voice and messages”; 3G—the third generation and 4G—the forth generation with functions”mobile video, online games, etc”, there is no big difference between computer and mobile phone(Li, 2005). In this sense, the mobile phone is not just a phone, but also a multimedia carrier and become a “communication—media” sector.


Image 3: 3G coverage map in China(source from website of China Unicom, http://www.chinaunicom.com/service/chinamap/wlfg_english/index.html )


Image 4: 4G coverage cities in China(source from website of China Unicom)[24]

Wired digital communication is based on optical fiber communication technology and 4G mobile communication network is based on “TD-LTE” technology which has the technical condition needed by “ media”. This allows TV media to use its advantage in the content, cooperate with telecommunication sector and carry out related television services on telecommunication network. IPTV (based on the development of wired communication network) and mobile TV (based on wireless mobile communication network) are the productions of the cooperation of television and telecommunication on support of national policies which gives television some new transmission channel and new development space. These are the path choice of television on telecommunication.

Third, make good use of the Internet platform and construct television station website and network TV station

The development and construction of wired Internet and mobile Internet not only provide the network an opportunity to make good use of triple play for Internet

[24] The translation from Chinese to English: the picture said that China Unicom has opened 4g network and service at 295 cities in China and there are 56 text cities of hybrid networking, they are: Beijing, Tianjing,Tangshan, Shijiazhuang, Taiyuan, Huhhot, Shenyang, Dalian, Changchun, Harbin, Jinan, Qingdao, Yantai, Zhengzhou, Luoyang, Shanghai, Nanjing, Suzhou, Hangzhou, Ningbo, Hefei, Fuzhou, Xiamen, Nanchang, Wuhan, Changsha, Guangzhou, Shenzhen, Dongguan, Nanning, Haikou, Chongqing, Chengdu, Guiyang, Kunming, Xi’an, Yulin, Lanzhou, Xining, Yinchuan, Jiaxing, Foshan, Quanzhou, Weifang, Wenzhou, Fuyang, Wuxi, YIchang, Hengyang, Guilin, Langfang, Linfen, Nanchong, Weinan, Nanyang and Nantong.

operators, but also provide a new path choice to carry out relative television business for television media using network.

Until now, Internet is a most mature network in the realization of triple play in China (Ding&Zheng). The development and construction of next generation Internet are based on IPV6 technology and there are great promotion on IP address, bandwidth, speed, etc (Ma, 2013). For this reason, Internet will technically meet the requirement of transmission of high-definition TV.

The use of Internet by television is an important issue which must be thought carefully. To some extent, if television media makes good use of Internet or not that relates to the survival of  television media. Who owns the Internet, who will have the large audience in the future, who will possess a dominant position in the coming era of triple play and who can realize leap-forward and sustainable development. The development of television station websites and network television station are based on wired Internet, mobile Internet television are based on the mobile Internet, these two examples are the “route selection” of television media making full use of the Internet in China (Wei, 2010).

In relation to all these three “network” route, the first one is based on digital broadcasting network itself, the second and the third are based on telecommunication network and Internet, respectively. Television media’s survival and development is based on digital broadcasting networks. Because of the ownership of the network infrastructure, the television media can make full use of the infrastructure of broadcasting networks. As the basis of the ways of “survival and development,” accelerate the development of digital interactive TV, car TV, digital mobile multimedia TV and etc, based on the promotion of national policy to triple play, based on the next generation of wired broadcasting network, telecommunication and Internet sector are going to vigorously permeate through to carry out voice and data services on digital television network[25]. For communication network, because the telecommunication

[25] China network television industry market’s present situation and the investment prospect forecast from 2013 to 2018, http://www.gtdcbgw.com/newsInfo.php?id=14606, 2013

network has its private network and the voices services in the telecommunication sector has developed very mature in China. For this reason, television media can only use their advantage in terms of content and try to cooperate with the telecommunication sector to carry out the related TV services on the communication network, such as the way of “survival and development”, IPTV transmission by wired broadband communication network and mobile TV transmission by wireless mobile communication network. For the Internet, because the Internet, especially international Internet is a public and open network, television media can make full use the resources of wired Internet and mobile Internet and integrate with Internet by using various forms, in order to find the solutions for television media’s “survival and development” on the Internet, for example, as the background of the traditional television to establish network television station and television station website (Ding&Xu,2013).

Taking an overview of current path choice and ways of television media’s survival and development, there are wired digital interactive TV, digital car TV, digital mobile multimedia TV based on broadcasting network, voice and data services based on next generation broadcasting network which are all based on broadcasting network; IPTV and mobile TV based on telecommunication network; television station websites, network television station, mobile Internet television, mobile television network, etc.

## 4 Affecting factors to the “survival and development of connected TV”

In the case of China, there are many factors influencing the development of triple play: technology, operating and managing, market demand and government and policy, are generally believed as the basic driving forces (Gu, 2010). According to Gu Hong’s study on the core issue of the Chinese media convergence, “The development of triple play and media convergence began with technological innovation, resort to institutional innovation, deepen with industrial innovation and performance in product innovation (Gu,2010).” Because SARFT (State Administration of Radio, Film and Television of China) is one of the major participants of the triple play, the influencing factors and pushing factors of connected television’s survival and development are the same with triple play. Connected TV and triple play’s influencing factors and pushing factors are almost the same. Given all this, this section presents a study of influencing factors of the survival and development of connected TV from four aspects: technical, management, user’s demands and the government management (Yang&Zhou, 2015).

### 4.1 Technology

The development of technology, in some levels, is the basic power of media development and the appearance of new media. The development of digital technology, broadband network technology and triple play not only promote the birth of the fourth and fifth media ( Chinese scholars divide media into five levels, the first one is press, the second is radio, the third is television, film and other visual media, the fourth is Internet based on PC and the fifth is mobile communications based mobile phones(Zhang&Jin,2010)), but bring in more media channels, terminals and platforms for traditional media (Hu, Yang & Liu, 2015). Throughout history the technology has been in the "center" of the development of the media (Chisholm, 2010:4). Besides the positive considerations of this phenomenon, some authors claim that new technologies have caused a “dramatic transformation" in the media

industry (Holt, Perren, 2009:101), According to Qin Yan[26], every progress in technology will promote a revolution in communication media, will prompt the birth of new media (newspaper, radio, television and other traditional media were the “new forms of media” after the breakthrough on communication technology). The former breakthrough in technology had lead to the emergence of new media, while digital technology, broadband technology and three network convergence influence television in different ways, not only directly making mobile phones, computers into new forms of “media”, but also expanding all kinds of traditional media’s transmission channels, terminals and platforms (Hu, Yang&Liu,2015).

Technology is decisive for the formation of new media forms (Wang,2007). And digital technology, broadband network technology, and three nets fusion technology allow for traditional media to develop a variety of channels. The influence on transmission by digital technology, broadband network technology, and three network convergence technology is completely different from traditional media. Three network convergence technology can greatly enrich information dissemination channels.

In terms of network technology, the development of broadcasting network allows television to carry on voice, data services and bidirectional digital television through cable TV network, digital car TV through wireless digital television network. It also has given birth to handset TV, mobile television and network TV station through cable network or Internet (Huang, 2009). All these network developments provide television with new supporting transmission channels in the implementation of “ the survival and development of digitalized”. What in relate to terminals, digital car TV, mobile multimedia TV terminal, iPhone as the representative of the smart phone, and iPad as the representative of tablet PCs are adapting to network development. The acceptance and usage of TV programs promote the development of television. Due to the development of the network integration and terminal integration, television business scope and as for platforms have been increased to an unprecedented level and not only can transmit more and higher quality television programs, but also

[26] Qin Yan, Scientific and technological progress and the evolvement of media, Science and Technology Management Research, 2006(11), pag. 49—55

provide platforms for non-video services. The development of platforms gives television an unprecedented development opportunities in China (Dong&Fan, 2006).

In China, the construction of networks (cable, terrestrial digital television, cable broadband communication, 3G/4G mobile communication and web 3.0), the development of terminals (bidirectional digital TV, mobile multimedia terminals, IPTV, smart TV and tablets PCs), the latest information technology research, and the Internet are the keys to accelerate the development of triple play and of “digital TV” (Wei, 2010).

### 4.2 Operation and Management

Operations management is concerned with managing the resources that directly produce the organization service and products. The objectives of production management are “to produce goods and services of the right quality, in the right quantities, according to the time schedule and a minimum cost” (Slack,Chambers & Johnston, 2010). With regard to a growing television enterprise, operations management is becoming one of the major factors affecting the survival and development of connected TV. The management system directly affects to new television enterprises’ management autonomy (Wu,Zhao & Dong, 2013).

Enterprise management system can enhance the vitality of television companies, reduce the shackles of the main management body and form a separate independent business entities. Television companies can arrange their own business activities in accordance with the needs of the pursuit of high benefit and take advantage of all the modern management tools, including merges and acquisitions, restructuring, cross-industry cooperation, listing and financing, allocation resources reasonably (Wu, Zhao & Dong, 2013). while business entities are bound by enterprise management, the enterprises are operating following instructions and they will not participate in market competition as a completely independent subject. Some substantial Chinese television enterprises have accelerated the system change. They can start from the management system, accelerate the cultivation of autonomous business entities, use

a variety of modern management methods, allocate resources reasonably and participate in market competition (Dai,2010).

The transformation of television enterprise from institutional departments to free enterprise (in China, before 1977, every TV station was stated-owned. From 1978, the state TV station began “state-owned-enterprises reform” (It is reform about changing the ownership of state-owned-enterprises. These enterprises are becoming combination of publish ownership[27] and private ownership and private ownership), except for China Central Television) and reinforcing the vitality of business entities are providing intrinsic motivation for the implementation of the survival and development of connected TV. Integration of  a variety of television broadcasting in platforms, rational allocation of resources and strengthened cooperation with relevant enterprises, seeking financing by listing on the stock market are providing external power for the implementation of the survival and development of connected TV (Liu,Chen & Zhang, 2011).

Chinese television operators can put their focus on accelerating the fully adaptions to the market competition, integrating various resources, reinforce cooperation with television related enterprises, multi-channel financing, gathering social capital and resources to television industry, improving and perfection the formation of the industry chain.

### 4.3 User demand

User demand has long been a source of power for the survival and development of television. There are “new demand” of television programs, platforms and terminals, and television is necessary for seeking the survival and development of the digitalization (Liu,2013). Audiences’s “new demand” mainly reflects on the following aspects: First, it is more and more obvious that television is shifting from “mass communication” to “mass-decentralized communication or sub-communication” (Liu, 2011). In other words, television audiences with different ages, different classes and

[27] China is a Socialist country with Chinese characteristic, so state-owned is equal to public owned.

even different gender are very different in the demand of television programs. Audiences have a significantly changed in the pursuit of personalized television programs, autonomy viewing experiences and diversified new services. The change of the audiences forces television industry to seek another development way which is necessary for television innovating in operators and dissemination, increase new businesses and services to adapt to the change from “mass communication” to “sub-communication”. From this perspective, the “new demand” on the viewing experience and new business gives television motive force of development (Liu, 2011).

While the tempo of people’s living is speeding up, we are spending less and less time at home, more and more time in working place and commuting. This change makes television service extend in time and space, in order to meet user demand of television at anytime and anywhere. This will undoubtedly expand the dissemination space of television and fill up the missing field of traditional TV, for example “mobile space”, “outdoor” and “independent and individual space” (stan China,2013). In this way, television can spread to everywhere in anytime. Moreover, more and more receiving terminals with video services, especially 3G& 4G mobile phone and handheld multimedia terminal are serving as “personal TV” for the audiences (Wang, 2012). In the future,  more and more audiences may have this kind of “personal TV” and provides television industry an opportunity to provide audiences with 24 hours’ personal television service (Zhu,2012).

Digital interactive television and IPTV offering services with personalized content and two-ways interactivity functions are meeting the diverse user demand and autonomy viewing experience; digital car TV is using the mobility and aiming at moving people to expand the development space of television; mobile TV and handheld multimedia television as totally personalized receiving terminal are meeting the audiences individual needs. The development of communication platforms or terminals mentioned above are customer-centered and meet the individual needs of the users (Liu, Chen&Zhang,2011). The television enterprises need to accelerate the construction of user-base or Installed base (the Installed Base is a repository that contains vital information and details of a service provider’s customers, products, and

services[28]), establish feedback platform, collect users information, customer-centered and to meet the diversified demand of customers. Terminals' research and development should be based on the daily needs of customers and improve the transmission efficiency. They also need to adjust their operating strategy to customers' habits in order to attract customers' attention. If television enterprises want to a better future, they should pay more attention to user demand.

### 4.4 Government and policy

In China, government supervision is an important factor influencing the implementation of the survival and development of connected TV. It can speed up or slow down the development trend of television industry. Timely and enlightened policy can accelerate the process of triple play, follow the trend of triple play development, create conditions for the survival and development of connected TV, expand the business scope of television industry, increase profits and realize the sustainable development of television industry (Fu, Peng &Ren, 2010). On the contrary, if the government does not take appropriate measures or change related policies facing with the trends of triple play, all the related subjects including television will miss the development opportunities. This situation will influence the development of related industries and also makes can put China at risk of falling behind in the new wave of information technological revolution and information infrastructure. The impact of government level in the development and survival of connected TV mainly includes: legal system, regulatory system, supervision system, policy guidance (Du,2009). Adjusting and improving laws give television legal protection when exploring business in telecommunication industry and Internet industry; policy guidance gives television some policy support in network construction and technology development, content and business development, and industrial policy.

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[28] Installed Base, concepts and procedures, Oracle, April, 2000. https://docs.oracle.com/cd/A85683_01/acrobat/cs1151ug.pdf

In January 13, 2010, the State Executive Conference of China[29] and in early June 2010 the triple play pilot program (see appendix 1) were promoting triple play and the development of television by the government and designed a plan in detail to triple play from legal protection, the regulatory system, industrial policy, etc.

According to the "Twelve-five" Special Plan of the technology development of National Broadband Network[30], Chinese government has to accelerate the relevant legislation to triple play, to build efficient regulatory system, to refine and improve industry supporting policy that promote the development of triple play and television.

[29] The State Council Executive meeting is one of the existing statutory meeting of the State Council of PRC, is composed of the primer minister, deputy prime minister, state councilor and secretary general, convened and chaired by the prime minister. The aim of the meeting is to discuss and to make decision of the major issue of the state Council. Generally held once a week. (source by the website of the State Council)

[30] http://www.most.gov.cn/tztg/201206/W020120621537446874940.pdf

## 5. Case study of China Network Television

China Central Television (CCTV)[31] is one of the most successful, the most comprehensive and the most typical cases in the survival and development of connected TV in China and has great analytics value. China Network Television(CNTV)[32] belongs to China Central Television and is the main platform to implement the survival and development of connected TV. This part will take the varieties of network based propagation service of China Network Television as the research object and discuss how television or the channels will put its strategy of the survival and development of connect TV into action.

### 5.1 Basic information of China Network Television and its networked survival and development from 1996—2015

5.1.1 The overview of China Network Television

China Network Television (CNTV) as a national web-based TV broadcaster officially came into service on December 28, 2009 and was based on the establishment of CCTV (China Central Television) Internet site that came into use on December 26, 1996. CNTV became a major platform for the networked survival and development. China Network Television finished the transformation from a new media department belonging to China Central Television to a media which is of equivalent importance to CCTV. CNTV as a web-TV service provider, mainly does the transmission of CCTV programs and it is qualified for providing services, for example: live video, rebroadcasting, video-on-demand, downloads, searching for video and audio and

[31] China Central Television(CCTV) is the national TV station of China and it is one of China's most important news broadcast companies. (Brief Introduction to China Central Television (CCTV), http://english.cntv.cn/20091207/103449.shtml)

[32] As a national web-based TV broadcaster officially launched on December 28, 2009, China Network Television (CNTV) provides users with a globalized, multilingual and multi-terminal public webcast service platform. It offers interactive audiovisual services, integrating features of internet-based operations with those of TV programming.(CNTV profile, http://english.cntv.cn/20100609/102812.shtml)

other services. CNTV has been a polite enterprise of the reform of the cultural management system of China[33] and will operate on industrialization, marketization and commercialization model (Research Group of News Study of Xinhua News Agency, 2010). Until 2014, China Network Television provides services—IPTV, mobile TV, network television station, mobile media(including “CCTV mobile media—bus”, “CCTV mobile media—subway”, “CCTV mobile media—civil aviation”, “CCTV mobile media—railway”, “CCTV mobile media—express”, “CCTV mobile media—building”, “CCTV mobile media—hotel” and “CCTV mobile media—plaza”), these four platforms for computers, television set, mobile phone and mobile receiving terminal are available through different network communication platforms to receive information (Sichuan Institute of Radio and television journalism and mass communication, 2015). By creating multilingual channels, China Network Television embarked on the road of globalized, multilingual and multi terminal.

### 5.1.2 China Network Television’s development history and the exploration of its networked survival and development.

The process of CCTV “networked survival and development” is the way to triple play. We can clearly see it from development path shown in table 2. Since 1996, CCTV enter into the information dissemination era. In the last nineteen years, China Central Television’s information disseminates gradually from nothing to something, from little to big, from weak to strong, from non-mainstream media to mainstream media (Yi, 2010). In the trend of China Network Television development and the process of exploring its networked survival and development, its development stage can be divided into the following phases:

[33] President Xi Jinping of China stressed at the National Conference on the Publicity and Ideology Work that, we should continue to advance the cultural system reform, boost comprehensive prosperity of cultural projects and development of culture industry. Xi’s remarks further clarified the basic guideline to accelerate cultural reform and development. We should deepen cultural system reform, continuously carry out systematic, integrated and coordinated reforms, allow the market to play a positive role in the allocation of cultural resources, motivate the people working in the cultural fields and the whole society to make innovation, promote a prosperous development of cultural projects and culture industry, and provide better cultural products and services.

table 2: the development of CNTV from 1996 (source by Wang, 2010, http://www.126doc.com/p-981467.html )

| | Case study of the development of China Network Television |
|---|---|
| 28, December 1996 | CCTV website set up and started trials. It was one of the earliest web service to release Chinese information. It was an integrate media website based on information services and mainly introduced and forecasted the CCTV programs. |
| 1, January 1999 | CCTV website was revised and officially released. Revision of the CCTV website, marked the first great speeding up of CCTV on the development of the Internet, and also reflected the preliminary exploration on development model of CCTV International website. |
| 26, December 2000 | CCTV website was renamed CCTV International network, referred to as CCTV International. |
| 25, May 2001 | CCTV established office of editor and net propaganda department. China Network Television was incorporated in the office of editor. In this sense, CCTV international integrated into a department of CCTV. |
| 25, May 2002 | CCTV international launched television programs such as “television criticism”, “online story”, “television presenter” and so on. It was an important initiative by CCTV international. |
| 8, August 2005 | CCTV international launched its original television channel: News Channel and Entertainment Channel. The opening of these two channels marked CCTV international as an independent media accessing to the original. |
| 28, April 2006 | Approved by the SARFT(the state administration of Radio, Film and Television of the People’s Republic of China), International obtained business certificate for IPTV, mobile TV. The carrying out of IPTV service and mobile TV service marked that CCTV international began the development of multi-network, multi-terminal and multi-platform. |
| 11, December 2006 | CCTV international launched wireless web TV by wireless mobile network. |

| Case study of the development of China Network Television | |
|---|---|
| 18, December 2007 | CCTV international launched digital car TV, covering more than 30 Chinese cities, 50,000 buses and 100,000 LED screens. |
| 28, December 2009 | China Network Television officially launched which was positioned as China's National network television organizations. It was a public online service platform with characteristics of globalization, multi-terminal, multi-lingual and visual interaction as the core. |
| 1. July 2010 | CCTV international and China Network Television fully integrated. |

First, the establishment and the initial development stage (1996–1998)

CCTV international website is an internet-based broadcaster of China Central Television which launched on 28 December 1996 (Liu,2007). It was an Integrated media website based on information services. It mainly introduced and forecasted the CCTV programs and was the supplement and extension of CCTV. CCTV international is the essence of the online version of CCTV and did not have its own original content. At that stage, CCTV international website was still in the beginning stages and was only a subsidiary department of CCTV. It was still in the initial marginalization condition and far from being an independent online media (Dai,2010).

Second, the exploratory phase of online media (1999–2005)

Since 1999, with the development of the Internet in China, CCTV website had developed rapidly. CCTV website was renamed "CCTV International", In terms of status, CCTV international upgraded to a sector editor of China Central Television, came up with concepts "Communicating China, Audiovisual global" (Liu, 2007);

status and development strategy of “four new concepts” and “three steps”[34]. Especially the running of a number of self-published programs and network news channel and entertainment channel, marked the beginning of CCTV international as an independent internet media form. At this stage, CCTV international was exploring on the way to an independent network media, seeking the characteristics of network communication: on the content, got news, information, entertainment and service together; on the media forms, got text, pictures, audio and video together. CCTV international could make full advantages of the characteristic of network interacting, strengthen interaction with CCTV and carried on the preliminary exploration on enterprise mode of operation (Peng, 2005).

Third, the multi-terminal and multi-platform development phase (2006–2009)

From 2006 to 2009, CCTV international focused on the exploring of the characteristics of network media communication, and achieved a great breakthrough on multi-terminal and multi-platform communication, IPTV, mobile TV, mobile digital TV and other platforms (Wang, 2010). At this stage, CCTV international realized the development from single network communications platform to IPTV, mobile TV, Digital car TV and other multiple networked survival and development. CCTV international as an independent online media was on the way to perfection and got start down a path to the success in social and economic benefits (Wang, 2010).

Fourth, the stage of development by leaps and bounds (from 2009 to 2015)

The fourth period was marked by the establishment of China Network Television (CNTV) in 28 December 2009. China Network Television was the latest activity of CCTV’s network survival and development. The essence of CNTV is CCTV using the

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[34] Peng Lan, (2005)The first decade of network media in China. Tsinghua University press. pag.105
four new concepts is trying to construct CCTV international as the new frontier of propaganda network for China Central Television; new channel for introduce famous programs online; new platform for show sales and new economic growth point of CCTV
three steps:
1. Service and integration, the emphasis was on integration of CCTV’s existing resources and interacted with television; 2. development and innovation, the key was to play the strong point of network communication, presented good programs of “CCTV international”; 3. Globalization spread. To strengthen the construction of the English version, realized the internationalization and cross-cultural communication of Chinese national culture.

Internet to build online TV broadcast organizations and is means a great extension, expand and improve of traditional television. With the broadcasting of China Network Television, CCTV's network survival and development had already reached an unprecedented height, achieved four communications platforms: network television, IPTV, mobile TV and digital car TV (Zeng & Wu, 2012). At the same time, China Network Television had been officially listed as a pilot enterprise of the reform of the cultural management system and was actively planning to list on the stock market (Yin & Xu, 2010).

The above four development stages on network of China Central Television, CCTV has been deepening the understanding of triple play. In the development and application of a variety of communication channels, content construction suitable to all kinds of transmission platforms, the exploration of new business and the innovation of operation and management modes, the above changes are all the CNTV developed from the early tentative days to a more mature stage.

### 5.2 Analysis of the main platform of the implementation of China Network Television "network's survival and development"

#### 5.2.1 CCTV Mobile Television

CCTV mobile TV is one of the four big platforms of CCTV implementation of network survival and development. I will analyze the development of mobile TV from technological realization, content, operation mode and regulatory approach.

Technological realization. Until 2014, mobile TV of China Central Television is mainly through China Mobile[35]'s TD-SCDMA network, China Unicom[36]'s WCDMA network

[35] China Mobile, as the leading mobile services provider in Mainland China, the Group boasts the world's largest mobile network and the world's largest mobile customer base.(http://www.chinamobileltd.com/en/about/overview.php)

[36] China United Network Communications Group Co.,Ltd ("China Unicom") was officially established on 6 January 2009 on the basis of the merger of former China Netcom and former China Unicom. With a modern communications network characterized by nationwide coverage and global reach, China Unicom mainly operates fixed and mobile communications service, domestic and international communications facilities, satellite IPLC service, data communications service, network access service, value-added telecom services and system integration service related to information and communications services. (http://eng.chinaunicom.com/about/Eng-gsgl/index.html)

and China Telecom[37]'s CDMA2000 network transmission. They use advanced streaming websites providing CCTV's mobile TV to customs, providing high quality audio and video services. China Mobile launched "Monternet" service, China Unicom launched "3G" platform and China Telecom launched "E-surfing" are the main platform for CCTV launched mobile TV service (Ji, 2010).

Content. CCTV mobile TV relay on the advantages of the resources provided by CCTV. CCTV provides CCTV-1 general, CCTV-2 finance,CCTV-3 entertainment, CCTV-4 international, CCTV-5 sports, CCTV-6 movie, CCTV-7 military and agriculture, CCTV-8 TV serial, CCTV-9 documentary, CCTV-10 science and education, CCTV-11 opera, CCTV-12 society and law, CCTV-13 news (in Chinese), CCTV-14 child, CCTV-15 music, CCTV-News (In English), CCTV-France, CCTV-Spanish, CCTV-Arabic, CCTV-Russian, CCTV-5plus sports, and other programs totally 22 live channels (CCTV website, http://tv.cntv.cn/pindao/ (03/09/2015) ). At the same time, CCTV mobile has its own programs resources providing on demand and download services. The programs mainly suited to the characteristics of mobile phone: news, information, entertainment, leisure, consulting, sport, film, television series and other types (Ji, 2010).

Operation mode. CCTV mobile TV provides a rich, colorful mass content and explores a variety of operation mode, like live broadcasting, request the broadcasting, download, customize and other operation mode meet the needs of diverse users viewing experience. Live broadcasting mainly rely on CCTV program resources and CCTV provides many live programs; On demand mainly is the use of CCTV mobile TV its own repository and attract users who like to watch short, precise and fast programs; The users can download their favorite on-demand programs and save to their mobile TV, so that users can enjoy shows at anytime and anywhere. It is a utility function to strengthen services of mobile TV; Customized is according to

[37] China Telecom Corporation Limited is a full services integrated information service operator and the world's largest wireline telecommunications, CDMA mobile network and broadband Internet services provider, providing basic telecommunications services such as wireline telecommunications services and mobile telecommunications services, and value-added telecommunications services such as Internet access services and information services in the PRC. (http://www.chinatelecom-h.com/en/company/company_overview.php)

different needs of different users, creates a variety of distinctive mobile video products and pushes customized contents to the users mobile phone (Dai,2013).

Regulatory approach. Until 2014, network equipment, business platform, marketing channel, customer service and billing of CCTV mobile TV are mainly in charge of communication operator. Integrating content, audit and the construction of broadcasting platform are in charge of CCTV. According to the “pilot program” of the state council of China (It is a policy launched by Chinese Government at 2010, see appendix 1), CCTV is in charge of the construction of Chinese mobile TV’s broadcasting platforms, whereas communication operators are providing networks for mobile TV (China Media Report, 2014).

### 5.2.2 CCTV’s network TV station—CNTV

CCTV’s network TV station (China Network Television) is a national network television launched on December 28, 2009(Home page of CNTV). It is a major initiative for CCTV to adapt to triple play and implementation of networked survival and development.

The development of CNTV can be divided into three periods (Wang, 2010):

Start-up period (December, 2009): China Network Television officially launched on. At December 2009, CNTV released its home page, client and 5 professional channels which are news channel, entertainment channel, sport channel, podcasting channel and searching engine (Wang, 2010).

Polishing stage (2010–2011): In this period, CNTV launched 10 professional channels every year. In 2010 CNTV released: business news channel, discovery channel, education channel, movie channel, cartoon channel, game channel, and total 10 channels; in 2011 released: music channel, tourist channel, home shopping channel, Russian channel, Arabian channel, etc.

Expanding stage (2012–2014): CNTV released multiple terminal services that cover the mobile internet (smartphone), Internet TV (television terminal) and other multimedia terminal (car, train, plane, metro, and other public videos). At the same

time it released multi language channel outside China and professional channels in mainland China. Until 2014, CNTV has been a network of video-sharing platform including home page, professional channels, client slide and multiple terminal (Wang, 2010).

In the respect of operating mode, China Network Television is an online video platform and has a win-win cooperation with the video provider and video consumer (Wu, Zhang & Dong, 2013). That means, on one hand CNTV opens its door to all Chinese TV stations and video production agencies, collects high grade video content. TV stations and video production agencies can run their own channels and their own brand; on the other hand, CNTV provides video content and on-network broadcast rights to other multimedia terminal. CNTV can provide high-grade videos to more users (Yu, 2010).

In relation to enterprise system and mechanism, China Network Television is subject to the construction of CCTV network. CNTV concentrates on the modern enterprise management system, enhance internal management and self constraint. In capital source, it can be divided into three parts: Chinese government appropriated funds for CNTV, China Central Television raises money for CNTV and the other part is social financing (Ji, 2010).

The technology platform and the construction of the infrastructures of CNTV can be summarized: a net, two libraries, three platforms, four core technologies development and covered by multiple terminal (Yu, 2010). (see Image 6 below)


Image 6: Technical architecture of China Network Television(source by Wang Wenbin[38], A New Strategic Concept and Practice of China Network Television)

One net: Global Video Network Division (GVND). GVND is the basic found of the construction of China Network Television. Until 2014, CNTV had 20 mirror site in China, 10 mirror site outside China and set up a service network for sharing online video distribution based on the global telecom industry (Wang, 2010). “A Net” was equipped with 1000G broadband and more than 25000 servers.

Two Databases: the database of network video and internet users. China Network Television has built the biggest network video database in China (Wang, 2010). The ability of editing and processing video can reach to 1000 hours, the carrying capacity of upload video by netizens can reach to 5000 hours (100,000 videos) and its storage ability can reach to one million hours online video. Both databases can connect to

[38]Wang Wenbin, the current director of the CCTV network communication center, director of China International Television Corporation, deputy general manager, general manager of the International Network of CCTV, China's Internet TV station general manager and editor. http://www.cctv.com/viponline/20080221/107293.shtml

each other, which means netizens can watch all network video by searching and other forms and also can upload their own video to network video database to sharing to other netizens (Yin & Liu, 2015).

Three centers: share and interact center, developing and storage center and integration and broadcasting center. Through these three platforms, netizens, mobile users and co-operating agency can upload videos and share to public easily and also provide network, mobile terminal storage services (Yin & Liu, 2015).

Four core technology: technology of searching for video, technology of download, technology of video media player and technology of client application. These technology can provide perfectly video searching service and give customs a perfectly experience of upload videos, download videos, subscription, searching and sharing (Yu, 2010).

Multi-terminal covered. Traditional TV programs covers the terminal of Television set at home or at working places. The coverage of network television is wider. It can reach computers, hand-held terminal and media terminal in public places (Wang, 2015).

### 5.2.3 China Network Television's service concepts—worldwide coverage, rich content, interactive sharing and good experience

Until 2015, the construction of China Network television is at the beginning rage. It has some progress in the following aspects.

**The construction of content delivery network** (CND)[39] in all over the world. In order to construct international network, China Network Television accelerated the construction of global mirror site.

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[39] Content Delivery Network(CDN) defined as mechanisms to deliver a range of content to end users on behalf of origin Web servers. The original content is offloaded from source sites to other content servers located in different locations in the network. Each request is redirected to one of CND replica servers offering the requested Web page. (Jakub Gładysz and Krzysztof Walkowiak, Member, IEEE. *Modeling of Survivable Network Design Problems with Simultaneous Unicast and Anycast Flows, Published in: Logistics and Industrial Informatics, 2009. LINDI 2009. 2nd International Date of Conference: 10-12 Sept. 2009 Page(s): 1 - 6* )

In 2008, China Network Television had built three new mirror sites in Singapore, Dubai and Moscow, beside London and Los Angles. These five mirror site could cover Europe, North America, Southeast Asia, Middle East, Russia and other areas. In 2010, CNTV built five new mirror sites: Sydney, Saint Paul (Brazil), Johannesburg (South Africa), Toronto and Frankfurt to realize a good network coverage in the major region outside China (Wang, 2010).

In mainland China, there are 20 mirror sites including Beijing, Tianjin, Jinan, Nantong, Xi'an, Wuhan etc. In 2010, CNTV has built a mirror site in Taiwan. CNTV can provide better a service to the whole China (Wang, 2010).

In 2010, China Network Television's broadband was 60G. Up to 2014, the broadband of CNTV reached to 1000G and its carrying capacity reach to 10 million network video living broadcast, 2 million video on demand and 100,000 network video uploading everyday. In addition, China Network Television keeps cooperation with Akamai[40] and Limelight[41], achieving global seamless coverage (Yin & Liu, 2015).

**The construction of network video database.** China Network Television is increasing input to build the biggest network video database. It has built two video production base: network video base and mobile video base that promoted the production capacity of original content and video processing ability (Zhong, Feng & Yu, 2015). The daily video production capacity of Network video base can up to 2000 hours at the end of 2014, and mobile video base's production in 2014 is 2000

[40] Akamai is the global leader in Content Delivery Network (CDN) services, making the Internet fast, reliable and secure for its customers. The company's advanced web performance, mobile performance, cloud security and media delivery solutions are revolutionizing how businesses optimize consumer, enterprise and entertainment experiences for any device, anywhere. https://www.akamai.com

[41] Limelight is a top tier content delivery network (CDN) offering superior performance and high availability, featuring a massive network footprint, an object-based global file system that provides policy controlled cloud storage and replication, with powerful cloud-based software that enables organizations to deliver faster websites, more responsive web applications, the highest quality video for both on demand and live streaming, while operating at the scale needed to deliver software downloads and games updates to any device, mobile or fixed, anywhere in the world. http://www.limelight.com

episode original programs. These two video production bases are the biggest new media production base in China (Wang, 2015).

**Business development**. Until June, 2015, China Network Television has HOME PAGE of CNTV, CBox client application and some professional programs, for example: News, Sports, Entertainment, Movies, Economic, Documentary, and so on. Among them, CNTV-Documentary based on the large number of excellent documentary resources of China central television (CCTV), local TV station and various media organizations (Zhou, 2011). CNTV-Documentary will be the largest network interactive platform of video documentary. The users can search for their favorite video according to broadcasters, broadcast year, categories. Podcast station is a video sharing platform which is Chinese “YouTube”. Shoushi station is Chinese satellite television network broadcast platform which provides customers on live TV programs and also video-on-demand service (Yi, 2010).

**Multi-terminal construction**. China Network Television has live video broadcasting system and video on demand system. Until 2010, China Network Television has covered more than 30 cities, 40,000 buses, more than 50 million people watch CNTV’s program everyday: building television, metro television, etc (Wang, 2010).

In 2009, China Network Television actively carried out work on the construction of mobile video. China Network Television had been cooperating with Apple and launched a various application for iPone and iPad. For this reason, CNTV had put its business scale to the whole world (Wang, 2010).

### 5.3 Summarize the experiences and limitations of China Network Television

#### 5.3.1 Summarize the experiences of China Network Television

From the development process and development stage of China Network Television, the following several aspects of exploring experiences have important significance to modern television’s networked survival and development.

First, the exploration of a variety of transmission channels. Along with the development of triple play, China Central television is continuously seeking the

various possible ways to explore its networked survival and development, making efforts to diversify its communication channels and platforms to occupy beneficial position in the future information dissemination era. As mentioned above, television networked survival and development approach is divided into three areas (Sun, 2013):

1. Based on the digital broadcasting network transmission; 2. Based on communication network; 3. Based on Internet. The platforms have been developed and owned by China Network Television: digital car TV based on digital broadcasting network, mobile TV and IPTV based on communication network, network TV station based on Internet (Liang, 2009). In addition, with the development of 3G&4G mobile communication network, CCTV also actively develops mobile TV and other platforms based on mobile network. The construction of Digital Terrestrial Television (DTT) and China Mobile Multimedia Television are also accepted into development strategy. Digital car TV, mobile multimedia TV, IPTV, mobile TV and network TV station are the latest development approved by CCTV in the context of triple play (Liu, 2007).

Second, pay attention to content construction and the exploration of new business following the propagation characteristics of the various networks. China Network Television is serving China Central Television, at the same time, CNTV is trying to explore the development rule of Internet according to the propagation characteristics of various networks and actively exploit new content, business and services based on Internet.

1. According to development of broadband networks and the characteristics of large capacity, from the user's demand, China Network Television released a variety of professional channels and programs (Liu, 2007). In the content CNTV carries out three strategies: the specialization of channels, serialization of specialized channel and internationalization of channels (Liu, 2007). It developed from single Chinese channels to multilingual channels. China Network Television accelerated the construction of global mirror site and covered North America, Europe, Southeast Asia, the Middle East, Africa and nearly 100 countries and regions and

implemented the development strategy of globalization to meet different people, different languages, the user's individual needs to different regions. For example, in 2009, China Network Television only had five channels: News Channel, Sport Channel, Entertainment Channel, podcasting channel and bugu.cctv.com . Until 2015, CNTV has 111 channels including English Channel, French Channel, Spanish Channel, Russian Channel, Arabic Channel and other foreign language channels, and five national language channels: Korea Channel, Mongolian Channel, Tibetan Channel, Uyghur Channel and Kazakh Channel (Source from homepage of CNTV, http://tv.cntv.cn/pindao/).

2. China Network Television actively introduces new business and new services according to the development of new network technology and new network product (Li, 2014). For example, with the development of web 2.0, CCTV international (the predecessor of China Network Television) launched Podcast, Blog, Microblog, Interactive community, online education, medical services, providing traffic information, online shopping and other kinds of value-added services (Liu, 2007).
3. China Network Television introduces a variety of watching function centered on the user's experience according to the net-openness and interactivity. For example, in 2009, China Network Television included live broadcast, TV on demand service, playback, searching, download and other video services function. All the functions mentioned before fully embody the openness and interactive characteristics of network (Tan, 2015).

China Network Television is one of the most successful experience on network survival and development on the basis of the features of the network communication (Liu, 2013).

Third, innovated in operation and management. More than ten years' process of development of China Network Television is a continuous exploration of the mode of operation and management that adapts to the characteristics of Internet dissemination(Wang, 2013).

1. China Network Television is making efforts to make itself be an independent media institutions from a sector belonging to China Central Television. CNTV is gradually on the way to an independent entity with its own managing director and is cultivating a big and strong television new media organizations. The website of CCTV initially has positioned itself to do video programs introducing and trailers. With the development of networks and multi-platforms exploration, after several times adjusting its position, China Network Television's operation mode is marketization and transforming into an enterprise. The change of operating management has provided a broad stage to China Network Television in participate in market competition as an independent operator (Wen, 2010).
2. The videos of China Network Television are user-centered. CNTV is trying to enhance the users personalized experience and to realize its own development combined with customers satisfaction from the perspective of content production, business development and communication channels (Wang, 2014).
3. Strengthen cooperation and widen business scope. At the beginning of the implementation of the network survival and development of China Network Television, CNTV is cooperating with other related media on content and platforms. CNTV takes cooperation and win-win as an important operation principle (Wang, 2014).

Until 2014, China Network Television cooperated with 38 local satellite TV and 53 city channels in content and channels at the platform of network television (Number comes from homepage of CNTV, http://tv.cntv.cn/pindao/#jump_ws). Besides, it also cooperated with E-commerce Enterprise, online game Enterprise and other companies.

China Network Television did some exploration in the above aspects of its "network survival and development". Because of all the exploration of CNTV, China Central Television embarked on a road of "diversified, multiple-dimensions, three dimensional" (Xu, Shen & Lu, 2010). The concrete representation of its network survival and development is as follow: collection of news, information and

entertainment together; gathering television programs collection, watching television and group chatting of television together; collection mobile television, IP television, online television station and other communication platform together; gathering social benefit and economic benefit together and gathering dissemination in China and in the whole world together.

### 5.3.2 Summarize the limitations of China Network Television

China Network Television had explored a variety of network transmission characteristics, any possible ways and management philosophy of networked survival and development. China Network Television provides other TV media an example and guidance to networked survival and development. But there are some deficiencies on the road of networked survival and development of China Network Television, mainly embody in the following aspects (Wang, 2014):

1. The utilization of Internet resources is insufficient. For the communication network, the scale of the development of IPTV based on wired communication network and mobile TV based on telecommunication network are not big. Integration and development of broadcasting platforms of IPTV and mobile TV in pilot areas have not integration with communication network.

2. The content homogeneity, new business development is not enough. First, on the content of the network carrying has the tendency to be homogenization and failed to manifest the differences between different networks, different receiving terminals and different platforms. The tendency of homogenization of content makes television take the advantage of rich resources from transmission channels that were not being fully exploited; transmission ability did not improve with the development with transmission channels. Second, with the development of triple play, new business based on a variety of network services emerge in endlessly. CCTV did not build up “personal service, family service, community service and municipal service” (Yan, 2012).

3. Operation management cannot keep up with triple play. The development of triple play gave some relevant companies opportunity to participate on radio and television, communication and Internet services. Only relevant business entities to participate in

the competition, make full use of modern management methods, the rational allocation of resources as independent market players, they can win the development in the competition in the media. CCTV in the exploration of network's survival and development, the corporate restructuring, the main part of the market, the cooperation between enterprises are insufficient. Communication content and channel's integration efficiency are not high. Seeking financing by listing on the stock market and other resource allocation measures did not make the most of them (Yang & Zhou, 2015).

4. Limited on system, policy and system mechanism. In China, because of the separate management on Internet and business, the implementation of China Network Television (CNTV) on the survival and development of connected TV has not yet been forming a real market entity, and has not guaranteed by laws on telecommunication and Internet business, the separation operation has not been fundamentally changed and the relevant policies have not gone to be detailed. Those reasons mentioned before, to a large extent, hindered the survival and development of connected TV and lag behind the development requirements of triple play (Zhang & Shi, 2013).

## 6 Strategy Discussion on television media's network survival and development in China

With the rapid development of triple play, digital technology and broadband network technology, in China television has changed a lot. Television is no longer the same that it was ten years before. The traditional television receives the signal transmitted by Radio and Television Network in China, only video services. In the matter of information transformation just have news, sports, entertainment, etc. Traditional television receives only one function—"the audiences can only watch programs broadcast by TV station" and only one profit model—solely rely on TV commercial (Lu, 2015). After triple play, television transformed by network, at the receiving end, transmission platforms, the carrier content, multimedia form, transmission function, profit model and other aspects have a big step beyond the traditional television. In other words, television after triple play is on the path from "arrow" to "broad" (Research Center of State Press and Publication Administration, 2014). From this perspective, we have to change our impression of traditional television. Because of triple play, television has become "big TV". The so-called "big TV" means the carrier content, transmission platforms, business management of next generation television (television after triple play) that should be from single way to multiple, from single stage to multi-stage, from one dimensional to multi-dimensional, from content creation to transmission—the whole process of television transmission (Jiang, 2014). "Big TV"—here "big" is not only reflecting the increasing transmission channels and contents, but it also is relates to the thought and ideas of television to have a big innovation and adjustment (Lin, Li&Zhao,2015). Based on the "big TV" conception, and combined with the development and survival of connected TV, I will put forward some suggestions to the development and survival of connected TV from contents, technology, management and administration and government dimensions in order to provide some guidance on television in the context of triple play.

### 6.1 Television content in the context of three network convergence

Until 2014, there are three networks that can transmit television signal in China. They

are Radio and Television network, telecommunication network and Internet (Wu, 2010: 57). In the circumstance of no scarce information transmission channels, if television wants to occupy a favorable position in the triple play era, content development and business exploit are the key points.

In this era of “big TV”, there is no doubt that television still has the advantage in content. But if just use the traditional television content in all kinds of new television transmission terminal, content advantage will have no chance to resolve into transmission advantage (Sichuan Institute of Radio and Television Journalism and Mass Communication, 2015). Television enterprises can create new content and it will adapt to the requirement of development of triple play from production, integration, distribution, transaction, management and every section should be in accordance with the demand of the triple play (Wang, 2010). In this way, the “big TV” will be a program format with diversity and personalization. This is a demand of the construction of television content on the development and survival of connect TV in the context of triple play. Television content development in triple play era not only has to face the problems of content itself, but also we should consider whether the content follows the propagation characteristics of different networks, should consider the different character of being accepted by different terminal and should consider customers expectations and daily usage habits (Liu,2011). Only considering these factors above mentioned, the value of the content can be maximized. This section will make a discussion of the next generation TV content in the context of triple play from the construction of television content and the construction of matching system of content and transmission platforms.

### 6.1.1 the construction of television content structure system in the context of triple play

Television content structure system is trying to discuss the origin and formation of television content from the perspective of triple play (Dai, 2011).

First of all, the traditional television rich content resources, including live TV and content library formed by broadcast TV programs, should be one of the main sources

of the television content in the context of triple play. Of course, for this part of content resources, especially the traditional television content library, the most important is how to orchestrate and integrate the content (Wang, 2010). It is only through a certain resource integration and orchestration that it could become source of high-quality programs of the next generation of television content. If just copy the contents of traditional television to all sorts of new television terminal, it will be propagation homogenized of content which will not be able to adapt to the requirement of the triple play (China Radio and Television Equipment Industrial Association, 2014). For how to orchestrate and integrate the rich video resources of traditional television, we should follow the following aspects (Wang, 2014):

1. Pick and choose. On the very popular television news, information, entertainment and sports programs, organize the essential part by request the broadcasting, carousel, time-shifted TV, and other way to organize in order to meet the users freedom of choice and individual needs (Liu, 2011).

2. Recommend. Recommend top and hot content, today's hot, click ranking list and other ways to clients to maximize the value of quality programs (Cheng, 2011).

3. Propaganda. China Network Television can give the new broadcast TV programs and columns to the users as a gift that not only can satisfy the new consumer psychology of users, but also is a very good publicity of the newly established programs (Cheng, 2011).

4. Simplified operating system. To make the virtual world convincing to the user, the website of China Network Television should simplify user interface to minimize the click on the levels and use videos and pictures instead of text statement (Wang, 2010).

For example, Entertainment Channel of China Network Television has many high-quality contents recommended to the users: Today's headlines, top topics, the latest updates, content as subscriptions except for a large number of CCTV's famous entertainment on live and on-demand. And also this section of website is also very focused on the interface design and optimize the user experience with pictures rather

than text description (Ji, 2010).

Second, Internet's propagation characteristics are large capacity and openness (Wang, 2010). In addition to television organizations and Internet, television related industry can be content producers and disseminators, every netizen can become content producer and disseminator (Zhu&Peng, 2014). That's why the Internet has huge amounts of content. Television wants to develop and survive among three networks (broadcasting network, telecommunication network and Internet) who can make full use of Internet resources. Television companies can cooperate with Internet enterprises, in this way, the huge resources in Internet can be used in television, carry out new network business and services at different terminals and platforms except for traditional TV programs, and also can draw lessons from the developed Internet companies' mode (Jing, 2011). From this perspective, the Internet can be an important source of television content in the context of triple play.

1. The netizens can use the highly interactive (user interface) features of Internet users. The popular online video, high-traffic video can be used as content on new communication terminals such as: digital interactive TV, IPTV, handheld television, mobile phone, computer, etc after some certain reprocessing which can also play a very good communication effect (Li, 2015).

2. China Network Television can collaborate directly with relevant Internet companies providing some business or services belonging to Internet on digital interactive TV, IPTV and Internet TV station (Wang, 2010). For example, there are some strong television companies which have been cooperating with Internet companies in China. They are carrying out some services in IPTV, Internet TV station, such as E-business, online games are developed on Internet. At the same time, television companies could take advantage of the openness of Internet, and the interactive community, network video conferences, remote education, and other services can integrate into Internet TV station, TV station in web site, IPTV, digital interactive television, etc (Ta, 2010). Television companies can build "personal service, family service, community service as well as municipal services" (Sun, 2011). In this way,

the scope of television business can reach to studying, working, entertainment, life, social services and other traditional network operations.

3. Introduce the Internet topic into television. Television companies can create television program with networks characteristic which will be a source of television content in the context of triple play (Lin, Li & Zhao, 2012). For example, Zhejiang satellite TV has been cooperating with "Taobao[42]" and launched out a program named "Taobao world"; Hunan satellite TV is also cooperate with Alibaba[43] and opened the shopping channel. These television programs with network characteristics are becoming the next generation of television content.

Last, the television companies can build all kinds of user database of transmission network and terminal, and the effective use of the "ratings" of television programs function of the user database. Only in this way, they can know which programs or video the users like and can cooperate with the related companies.

### 6.1.2 The matching system of television content and transmission platform in the context of triple play

The matching system of television and transmission platform is exploring the problems of the matching of television content and transmission platforms and the connection, interactive inter transmission platforms from the perspective of triple play (NGB Committee of Experts，2010).

First, the matching of television content and transmission platforms. In other words, different content on the transmission platforms, so that the content is aligned with the

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[42]Taobao(taobao.com) is a popular Chinese online retail platform similar to eBay and Amazon. There are nearly 500 million registered users, more than 60 million visitors every day, the average sold 48,000 items per minute. It has become one of the world wide e-commercial platform. (http://www.taobao.com/about/intro.php?spm=0.0.0.0.o2XiKn) in Chinese

[43] Alibaba group was founded in 1999 by 18 people led by Jack Ma, a former English teacher from Hangzhou, China. They operate leading online and mobile marketplaces in retail and wholesale trade, as well as cloud computing and other services. There provide technology and services to enable consumers, merchants, and other participants to conduct commerce in their ecosystem.

platform and can host the best reflects of platform features content and enable a wide range of content and services to their respective platform that best suits its maximum capability (Dai, 2013). About how to match the content and transmission platform, take the following several aspects into consideration:

1. Study on three networks (Broadcasting network, telecommunication network and Internet) their own transmission and technical characteristic. The new technology can real-time track the applications in different network and the impact of TV broadcasting. According to the different characteristics of different networks and the similarities between networks, put the right content to the appropriate network to meet the different requirements of different network for delivering content (Jing, 2011).
2. Attach great importance to the difference of propagation characteristics and the use of characteristic of digital interactive TV, Internet TV, handheld TV, computers, mobile phone and other terminals so that the content can match with terminals (Ke, 2010).
3. Rearrange the various functional modules on the platform and separate two kinds of platforms: “content providing”—platforms with functions: live, on-demand, search, etc; “content building”—platforms with functions: upload, share, interactive community and etc. According to different functions of platforms, the corresponding content should be different. For example, online content like online games that is like more suitable for the platforms with highly interactive and personalized, rather than digital cable TV, mobile TV and other terminals and platforms.

Second, the implementation of “platform interaction”. The so-called “platform interaction”, means that a variety of communication platforms are maintaining good coordination and cooperation (Li&Fu, 2011). From the characteristics and advantages of platforms, television programs with the same content can be put into different platforms with different forms of multimedia, different content emphasis or different modes of transmission (Li&Fu, 2011). In this way, the “platform interaction” can

combine propagation, and transmit content with a three-dimensional effect and makes the content transmission with three-dimensional effect. In other words, audiences after watching a program on the platform, if they want to know about the related information, they can easily switch to another channel or platform. For news content, for example, except for broadcasting on traditional television, it can be broadcasted offered in the network television on-demand, in the form of short messages or press photography published on the web page of the TV station. And also, short tidbits related to news can be broadcasted on mobile TV or video sharing platforms of network television stations. In this case, various communication platforms can report news from different places or omni (multi)-directional dissemination according to the propagation characteristics of its own platform. This dissemination model avoids the homogenization of content propagation, also exploits news sources from multiple angles and promotes the value of news dissemination (Wang & Fan, 2014).

Third, strengthen the "interconnectivity" within terminals and platforms. One transmission platform can connect with other platform or terminal, or from one can easily enjoy services only provided by another platform to match the "platform interaction". It will facilitate the audience use of various terminals and platforms (Tan, 2015). For instance, when the audience see a piece of news on ifeng.com[44], they can easily turn to ifeng video (v.ifeng.com) platform for further information or the audience can enter the phoenix network platform (3g.ifeng.com) from phoenix network for mobile phone. The former is the "interconnectivity" between the same terminal platform and the latter is the "interconnectivity" between different terminals. Of course, there is no real terminal integration. The "interconnectivity" between transmission terminals and platforms, is mainly between different platform on the same communication terminal. Inter-terminal fusion is still in its infancy (Huang & Gu,

[44] Phoenix new media is one of the leading global cross-platform network new media companies. There are three different terminals: comprehensive portal phoenix net(www.ifeng.com), mobile phoenix net(3g.ifeng.com); phoenix video(v.ifeng.com); mobile client.

2009), with further development of triple play and terminal integration, the “interconnectivity” between terminals can be reached.

### 6.2 The construction of television network and the exploit of terminals and platforms in the context of triple play

In the context of triple play, as an important aspect of the survival and development of connected TV in China, an important aspect is to be driven by the three network convergence technology and related policies. How television can make full use of three networks television resources? How do new communication terminals, transmission platforms and multiple functional modules develop? If these problems can all be solved, television will transmit to everywhere at anytime and realize seamless coverage at any time. Then, television will enlarge its influence and seize the high ground of the triple play. The development of triple play provides television a variety of opportunities of the Internet communication channels, for example, the technology of triple play enlarges television receiving signal from only one broadcasting network signal to three network transmission and extends the television signal reception terminal from only terminal (television) to computers, mobile phones, mobile multimedia and other receiving terminals. The function of television transmission is from live to live, on demand, video search, download, upload, sharing, interactive community and a variety of functional modules. Moreover, the development of technology is endless, with the development of network technologies and terminal technology, the network who carrying the television content and service will be more and more advanced and the receiving terminals, platforms, as well as various functional modules also will be increasingly being developed and applied. Now there are some receiving terminals for example: television, mobile phone, computer, and later there will be other forms of receiving terminals; there are functions for example: live, on-demand, video search, download, upload, sharing, interactive community,etc; and later there will be more information transmission platforms and function modules (Huang&Wang, 2008). Apparently, the network technology, terminal technology and a variety of application platforms and the development of the functional modules are the basis and premise of the better

development and survival of connect TV. Only if there is a certain amount of information transmission networks, variety of receiving terminals and communication platforms, television will be in pole position in the era of triple play.

### 6.2.1 The construction and use of television transport network in the context of triple play in China

If television wants to have a better development and survival of connected TV, first of all, it should dedicate itself to the construction of broadcasting network, the exploration of network technology and the use of communication network and Internet. Broadcasting network should accelerate the construction of cable broadband digital network, digital terrestrial television network and digital satellite television network; vigorously promote the development of radio and television information network, to speed up the digital cable television, two-way transformation; strengthen the network integration, optimize network resource allocation, improve the carrying capacities of television content and business of the cable broadband digital network, digital terrestrial television network and digital satellite television network(NGB Committee of Experts,2010); meet the operational requirements the service of broadcasting, telecommunication, Internet, such as “full service” (The State Council of the People’s Republic of China, 2010). The most important thing is to speed up the construction of broadband digital information network (next generation broadcasting network) based on three network technology, to break the structure of radio and television network, to integrate network resources and to build a nationwide unified radio and television networks operating entity. And in accelerating the construction of the network, at the same time we should focus on enhancing network security technology research(Li, 2015). In this way, radio and television network will be efficient to carry out the “whole business”, and to guarantee the safety of business and information dissemination.

The department of radio, film and television of China can make full use of the communication network and Internet, have a whole understanding of the development trend of telecommunication network and Internet which provide it with

the opportunity to actively explore the development of the possibility of receiving terminal, communication platform and function module, to expand business and services by utilizing communication network and Internet(Jing, 2011). For communication network, radio and television departments of China should pay close attention to the cable optical fiber communication network which is under construction and should pay attention to the fourth generation mobile communication networks who are based on Time-Division Long-Term Evolution(TD-LTE). According to the construction and popularity of broadcasting network, to the characteristic of the network, the department of radio, film and television can carry out high quality IPTV and mobile TV services (Li, 2014). For Internet, the next generation of Internet based on Ipv6 technology is its development direction. The department of radio, film and television should carry out HDTV programs service and some value-added services, should maximize the use of Internet resources based on rich network IP address, high speed, network security and other features (Lin, Li &Zhao, 2012).

### 6.2.2 The construction and utilization of television receiving terminal in the context of triple play in China

With the inceasing of three network convergence, various television receiving terminals have evolved from the only one television terminal before to bidirectional digital television, network television, computer, mobile phone, handheld television and other receiving terminals. And with the further development of three network convergence and the establishment and improvement of the related industrial chain, more television receiving terminals will be introduced continuously to the market(The 13th China International Optoelectronic Expo, 2011). Television companies should reinforce coordination and cooperation with the TV terminal manufactures to develop more different types of television receiving terminal. “Television is everywhere” should be an important aspect of concern in expanding business and the implementation of the development and survival of television. At the same time, depending on the development trend of convergence between different terminals, we should actively explore terminal functional modules suitable for television and the development of three network convergence and take full advantage of the resources(Xu, Shen, Lu&

Yan, 2010). In terms of the development and utilization of television terminal should pay attention to the following several points:

1. Television companies should actively coordinate and cooperate with equipment manufactures, should exploit and manufacture television receive terminal according to the technical standards for network and television acceptance criteria, enabling new products with better compatible network and the technical standard requirements for triple play (Li, 2011);
2. The development and manufacture of television terminals should correspond to the type of business development of television in the context of triple play (Wang, 2010). The new television terminals should combine these functions together: broadcasting, communication services and network services.
3. Television terminals design and manufacture should follow a " user-centric" principle which is not only in terms of convenient and practical, but is always connecting to users. In this case, there always is a suitable television terminal for client provided by television at every-time and everywhere (Ma, 2013).

### 6.3 Television business and management model innovation in the context of triple play

The operation and management of traditional television, at present in China, is dual system. In other words, traditional television is both a public institution and an industry (Li, 2006). It has to be a mouthpiece of Chinese party and government and also as an industry to get economic benefits. In digital era and the era of triple play, various media forms are emerging, especially the television program carrier (Ke, 2010). The development of receiving terminals based on three networks and multifunction module platforms provide a realistic foundation for the coming of the era of "big TV" and create conditions for television industrialization and scale operation (Sun,2013).

These realistic conditions for television in the process of the development and survival of connected TV provide a basis in operation and management model

different from the traditional television. An analysis based on modern management theory combined with the practical needs of the development and survival of connected TV in the context of triple play, The operation and management mode of the development and survival of connected TV come into force with corporatization and commercialized mode in China. Fostering independent business entities and strengthen the cooperation of industry are the inevitable choice of television (Research Center for Media Development, Wuhan University, 2005).

### 6.3.1 Fostering independent business entities and quiche enterprise reforms of television media

The formation of the business entities is the basic element in the development of market economy. Only an independent management body with fully market-oriented policy can win the market competition in accordance with the principle of "independent management, self-financing", can effectively reach an integration of resources, can expand their business with the guide of the use of market (Zhu & Guo,2008). Connected TV as a new media of contemporary television, especially in the context of triple play, to make the advantage position in the intense competition in the media industry. It must form an independent management body to participant in market competition.

Until 2014, apart from CCTV, Shanghai Media Group[45], Hunan Television and a few other television media have a certain scale, others are relatively small. Accelerate the breeding of new television channels is substantial of the implementation of the development and survival of connected TV in the context of triple play is extremely urgent.

First of all, those television media groups should gradually implement the enterprise system. Traditional television media groups belong to public institution. They are the mouthpiece of Chinese government (Research Center for Media Development, Wuhan University, 2009). As the establishment of the market economy system in

[45] Shanghai Media Group, referred to as "SMG", is one of the largest media group in China. Business covers the media business operation, network transmission, the performing arts, cultural tourism and television commercial, culture investment, etc.

China, they gradually changed to the business model of dual system—both public institution(state-hold) and industry(self-hold). And until 2014, with the development of three networks convergence and media fusion, various new television media show some flexibility in the operation that create the conditions for the television media transforming to enterprise (self-hold). The traditional television media groups continues to keep the administration system with both public institution and industry. These new developed television media such as digital interactive TV, mobile TV, IPTV, mobile multimedia TV, network television station, Internet TV, etc can be brought into the management system and could conduct the operations and management in accordance with the modern enterprise management system (Tu, 2011).

Second, break the limits of geographical areas and form new television business entities with large scales. The integration of network resources, and the utilization efficiency of network resources are an important issue that required attention in the era of triple play (Lin, Li& Zhao, 2012). For example, at the same time of the construction and renovation of cable radio and television in 2008, “accelerating network integration, forming a national network company, build a subject of operation adapt to triple play”(Bao, 2010) was a significant step towards the establishment of a national unified business entities.

### 6.3.2 Broad the scope of business and strengthen the cooperation of cross-media and cross-industry

Modern television media industry is a huge industry, not only involves many TV related downstream industries, but also involve numerous industry irrelevant with television. Modern TV media business entities are impossible to handle everything. They should play their own advantage and avoid weaknesses, strengthening the content cooperation with television related industry and strengthening the platform cooperation with non-TV industry. They should take the road of cooperation and development to achieve a win-win situation with external forces (Zhou, 2005).

Until 2014, some strong television media companies cooperated with other

media(including traditional television media and online media), network related industry and other industry that is taking the first step to the path of cooperation. For example, since 2014 China Network Television is cooperating with 39 local satellite TV(see appendix 2) in China relying at the same time on the resources of China Central Television. And CNTV is also cooperating with mainstream news sites (such as people.com.cn, Xinhua,etc), four major portals (Sina, Sohu, Netease, Tencent), video sharing sites (such as youku, Tudou, Ku6, etc), P2P network television (PPTV, PPS, Uesee, etc) on content; CNTV is cooperating with Shanda Interactive[46] on online games and cooperating with some related industries to start with professional TV channels with industry characteristics. In addition to CNTV, Shanghai network television station who belongs to Shanghai Media Group, Mango TV who belongs to Hunan television are seeking cross-media and cross-industry cooperation and also rely on their “mother” television resources (Sun, 2013).

First, Content cooperation. Network capacity is huge. Various network new television media can cooperate with other media, including traditional media and new online media to meet their demand for content by using of these media resources (Yang&Zhou, 2015). There are three main sources of content:

1. Traditional television (Yang&Zhou, 2015). Traditional television has a great advantage in video program production. A variety of network television media, including mobile TV, TV, Internet TV, television station web site, network television station, etc, can use the television content of traditional television. These new online television related media cannot only rely on television content of their own “mother” television station, but also should cooperate actively with other television stations to broaden the program source.

2. The developing net media (Yang&Zhou, 2015). All kinds of emerging online media

[46] Shanda Games is a leading online game developer, operator and publisher in China. As a listed company dedicated to online game business, Shanda Games pursues the goal of "innovation and opening" with over 2000 R&D, providing a diversified product portfolio, offering users over 50 game products including massively multiplayer online role-playing games (MMORPGs), advanced casual games, webpage games, mobile games and etc. Shanda Games has received many heavy-weight awards such as Golden Plume and Golden Phoenix Awards for years with most awards in online game industry in China.(http://www.shandagames.com/us-en/company/company1.html)

such as mainstream news sites, portals, video sharing sites, P2P network television (such as PPTV, PPS, Uusee, etc), can also become the sources of their content.

3. Professional production companies (Yang&Zhou, 2015). Because of their program production system and specialized production level, also it is also a good choice of source of its content.

Second, cooperation on the platform. In the Internet era, although transmission platform is not in shortage of resources, with transmission platforms, television cannot be sure to achieve good communication effect (Zhu&Wei, 2010). Television in the implementation of the development and survival of connected TV should consider the use of transmission platforms from the following two aspects:

1. Spread self-made programs by using other platforms. Along with the development of network for a dozen years, a variety of network related industries are becoming their own industry advantage. In a certain field they have their own characteristics and formed a “cluster effect” (Zhang, 2013). That is to say, if someone needs for a particular network service, usually first click on a professional website who provide related services. Thus people who need such services are bundled together. Electronic commerce service, for example, if someone wants to purchase his goods through this platform, then he will access the professional e-commerce site first. Television media can take full advantage of this effect, cooperate with specialized network related industries, produce the corresponding video programs and placed them on its network platform. For example, they can work with e-commerce sites. The production of video content can be disseminated on e-commerce site. The “cluster effect” of e-commerce site will maximize trading volume of the media company.

2. Spread services form other industries on their own platform. Along with the advancement of triple play and the development of all kinds of online television media of television, online media, especially online video, has gathered a munger of stable audience. Television media can make full use of this valuable resource to

build a new transmission platform for other industries. For example, television can set up a network games platform on online platforms, such as: mobile TV, network television station. From another side, it provides new transmission channel for professional online game operators. All in all, making full use of both internal and external both platforms and strengthening the cooperation of platforms are important aspects of cross-media, cross-industry cooperation (Yin&Liu, 2015).

### 6.4 The construction of legal guarantee and supervision system of the development television media in the context of triple play in China

Legal system, policy and management on the government level are the precondition of the specifications and healthy development of any industry. Facing with the trend of three network convergence, if television media wants to develop, they urgently need some guarantee and support on legal system and policy (Li, 2015). Laws and regulation for triple play and suitable for China's national condition are the guarantee for television's development and survival in the context of triple play (Zhang & Xiong, 2015). In this section I will analyze the legal system of three network convergence and information industry of advanced countries and regions with laws and supervision of China. I will give some suggestions for the management of triple play on the government level, so as to give some help to create a more favorable legal and policy environment.

#### 6.4.1 To expedite to improve the legal system of triple play in accordance with China's national condition

On a worldwide basis, the countries leading in the development of triple play adapted and tailored their laws and regulations about broadcasting, communications, Internet in the face of new trend of the development of the information industry and triple play. These modifications and adjustments provide a good environment and system guarantee for television in order to adapt to development of triple play (Zhang&Shi, 2013), for example, the United States, Britain, France, Japan, South Korea, Hong Kong and other information industry developed countries and regions. The aim of legal adjustment is to consolidate network resources to meet the new height of

information industry development (Zeng & Wu, 2012). Broadcasting network can freely expand into telecommunication business; telecommunication network conditionally expand into radio and television business. This rule of law of triple play no doubt creates a historic opportunity for television to start new business and increase profit(Tu, 2011).

In China, the Government and the related departments are always concentrated on the trend of three network convergence. The State Council executive meeting on January 13, 2010, decided to accelerate the fusion of telecommunication network, broadcasting network and Internet. Then, General Office of the State Council issued a notice—State Council Notice Concerning Issuing the "General Plan to Move Three-Network Integration Forward (hereinafter referred to as the General Plan)—which is the latest arrangement in the system of three network integration in China. "Radio and television enterprises conforming to conditions may operate value-added telecommunications businesses, basic telecommunications businesses comparable to value-added telecommunications business management, and Internet access business, Internet data transmission value-added business and domestic IP telephone services provided through cable television networks. Concentrated broadcast control matters for IPTV and mobile telephone television are the responsibility of radio and television departments, under the guidance of propaganda departments. State-owned telecommunications enterprises meeting conditions may, under the supervision and management of relevant entities, engage in radio and television program production and creation, except for current affairs-type programs, Internet audiovisual program signal transmission, transmission services for current affairs-type audiovisual news programs as well as public Internet audiovisual channel program services, except for under the form of a radio station or television station, IPTV transmission services and mobile telephone television distribution services" (the General Plan,2010). As can be seen from the General Plan, radio and television were licensed to operate the telecommunication business. But telecommunication business could only produce, transmit, broadcast and distribute radio and television network's programs, and there was no broadcasting right on IPTV and mobile TV.

This unequal two-way accessing for telecommunications and broadcasting policy gives broadcasting companies a buffer period, especially they grasp the initiative on the core business of IPTV and mobile TV. However, in order to hold the commanding point of the development of information industry and to integrate network resources, to play the strength brought by triple play, equal two-way accessing for telecommunication and broadcasting is the inevitable development trend in the future. Government policies only (alone) can't guarantee the healthy development of radio&television industry and they also need to ensure at the legal level. "Accelerating the establishment of a legal system adapted to the requirements of three-network integration. Formulating and perfecting laws and regulations for radio and television, and telecommunications sector management, tidying-up and revising corresponding documents and provisions, providing legal guarantees for radio and television organs engaging in telecommunications business and telecommunications enterprises engaging in radio and television business"(the General Plan,2010). This overview is more general, but there is no specific legislative principles of planning, did not give the details of possible guidelines. Facing with there is no suitable legislation, I will give some ideas on the principles of legislation should adhere in triple play:

1. Lawmaking should follow the principle of step by step, stage by stage. Lawmaking following the principle with step by step, stage by stage that is a progressive legislation policy considering the real situation of three network convergence in China and combining with the implementation of Pilot Program(The general Plan, 2010). First, select regions with a mature condition of triple play and legislative powers(such as Shenzhen) to be pilot cities; enact local laws and regulations; according to the situation of the implementation of the law in this area, adjust and modify the laws to fit the requirements of the development of triple play. On this basis, continuously expanding the breadth and scope of the pilot, so that the successful experience can be promoted on a larger scale; At last, sum up the experience of the promotion of this pilot in order to establish laws and regulations of triple play on a national scale.

2. The principle of the combination of equivalence and protection. This principle is mainly aimed at the radio and television, telecommunication business in terms of access to each other. Radio and television and telecommunication play two key roles. When making laws, legislative institution should give free access right to radio and television and telecommunication companies(Tu, 2011). In other words, radio and television operators can enter their business into telecommunication and the opposite telecommunication operate can enter into radio and television. This means that, in the legislation should adhere the principle of reciprocity.
3. The principle of the combination of economic interests and social benefit. This is in terms of legislation from macrocosmic and microcosmic. Except for radio and television, telecommunication and Internet these three department in triple play, also involves related upstream and downstream industries, such as information technology, terminal manufacture and so on. In the process of legislation, the interest of different industries should be considered. This is the microcosmic of the legislation which is to insist on the principle of economic interest of related industries; triple play also involves political, economic, cultural, social and other aspects. This is the macrocosmic of the legislation which is to adhere the principles of social benefit. Only unifying the economic interest and social benefit, taking from macrocosmic and microcosmic two aspect into consideration, can really see the development of triple play (Pang, 2011).

### 6.4.2 Establish a triple play supervision system according to China's national condition

The most distinguishing feature of triple play is the integration of networks, terminals and business, as well as the "multi-service" of operation subject. These features inevitably require that there is a unified department on the regulation of triple play. Under the oversight of the supervision can effectively avoid the conflict on the benefit between radio and television operator and telecommunication operator, can manage and integrate of resources, can improve the efficiency of supervision(Zhang&Huang, 2011). In the triple play leading countries, at he government level is generally

establish a unified regulatory agencies, such as the United States—FCC(Federal Communications Commission)[47] authorized broadcasting and telecommunication; the United Kingdom combined the original radio and television department and telecommunication department into an independent regulator —OFCOM[48] in 2000; The Japanese broadcasting and telecommunications regulations are incorporated into the MIC(Ministry of Information and Communications); in addition, Australia, Canada, Italy and other countries also have established a unified broadcasting and telecommunication regulators. On a world scale, the establishment of a unified broadcasting and telecommunication regulator is the objective requirement and inevitable trend of three network convergence.

In China, radio and television entities and telecommunication entities are independent supervised and the different of regulatory concept and regulatory system is huge. Radio and television department is supervised according to the system of public units and enterprise units, but telecommunication is completely according to the market rules(Li, 2012). This regulatory regime and their different ideas on supervision makes that the regulation to radio and television department and telecommunication department don't adapt to the objective requirement of the development of triple play. Facing with the reality of regulation system not suit to the development of triple play, I will give some ideas on the regulation of three network convergence in China referencing to “unified regulation” by developed countries on triple play:

1. The combination of government regulation and self-regulation(Li, 2012). Supervision on government should first consider the integration and adjustment of the monitoring functions of telecommunications and broadcasting these two

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[47] The Federal Communications Commission regulates interstate and international communications by radio, television, wire, satellite and cable in all 50 states, the District of Columbia and U.S. territories. An independent U.S. government agency overseen by Congress, the commission is the United States' primary authority for communications law, regulation and technological innovation.(https://www.fcc.gov/what-we-do)

[48] Ofcom is the communications regulator. We regulate the TV and radio sectors, fixed line telecoms, mobiles, postal services, plus the airwaves over which wireless devices operate.(http://www.ofcom.org.uk/about/?a=0)

department, should establish and improve the regulatory system adapting to broadcasting companies and telecommunication companies in the context of triple play; then according to the requirement of the pilot plan of bi-directional access, the government should establish a unified regulator with function of transition that is special regulation of radio and television, telecommunications. In this stage setting a small unified supervision department is trying to accumulate some experience for the future; on the basis of the first two steps, and then the government should consider to the establishment of a unified regulator department and set up an affiliated regulation group especially for broadcasting, telecommunication and Internet. On self-regulation, the radio and television operator and telecommunication operator can establish self-regulatory organization to regulate the broadcasting and telecommunication industries in legality and rationality in the process of triple play. The combination of government regulation and self-regulation, setting up a regulatory system with Chinese characteristics is a feasible direction of the reform on regulatory system for three network convergence.

2. The separate of network monitoring, business regulation and content regulation. Under the unified regulatory department, the government should set up specialized management agency for network monitor, business regulation and content regulation(Zhang&Huang, 2011). Among them, broadcasting network, telecommunication network and Internet can be unified regulation by the branch agency network monitor; business on radio and television, voice, data and other services can be regulated by the branch agency business regulation; content on every network should be regulated by the branch agency content regulation. This kind of regulation will raise the professional, targeted and scientific management.
3. The implementation of difference supervision. Because radio and television, telecommunication have different properties on their functions, regulation should be perfectly corresponde to each other. Broadcasting business takes audio and video as the principal thing which belongs to traditional media(Zhang, 2012). It is a popular propaganda tools and it should be specially supervised to have a better

understanding of what the public want; Telecommunication's major business is voice communication. The most important in this era is the privacy issues and the insurance of the confidentiality of communications is the focus of supervision; Internet's major business is data transmission that is mainly related to information security and network security. The regulation direction of Internet is to guarantee the security of network information transmission.

## 7. Conclusion

This thesis analyzes the development and survival of connected TV in the context of triple play from 2008 to 2015 in China and suggests some lines about how television can take advantage of broadcasting network, telecommunication network and Internet convergence to expand its development pace in the context of triple play.

This thesis gives some general information of triple play and the research background, etc. In China, triple play does not mean that three network merge in a physical way but in the information transmission and business (Fu,2010). Because of triple play, three networks' business is going to be similar. This gives television a big pressure and also opportunities. How to correctly deal with the challenges and opportunities of television is one of the most important point for the development of television. Faced with the challenges and opportunities, there are some possible ways open to television, for example: television enterprises can develop various value added services, grasp the State's policy of China and cooperate with telecommunication industry on television services, construct television station website by using Internet platform (Ma, 2013). Moreover, there are four affecting factors to the survival and development of connected TV: technology—the basic power of media development; operation and management, because of the unique Chinese enterprise system and "state-owned-enterprises reform", the television enterprise have more autonomy; user demand—a source of power for the survival and development of television; government and policy—can speed up or slow down the development of television. In China, the government released a lot of policies to create conditions and to make sure the development of television. For a better understanding, this thesis takes China Network Television (CNTV) as the case study. This part is dedicated to the current situation of CNTV and summarizes its advantages and deficiencies to provide some suggestions to television industries. Due to the fact that CNTV has a variety of transmission channels, it pays attention to content construction, explores new business and innovates in operation and management. CNTV has become one of the most typical cases in the survival and development of network TV in China (Yin & Liu, 2010). Although CNTV is very

successful in China, it has some deficiencies, for example: the utilization of Internet resources is insufficient, the content homogeneity, new business development is not enough, operation management cannot keep up with triple play, limited on enterprise system in China (Yin & Liu, 2010). The last part gives some suggestions to television from four aspects: 1. Television enterprises should make the best use of TV content (from traditional television and also from Internet), cooperate with television related companies in order to have a wider resource of content (Sichuan Institute of Radio and Television Journalism and Mass Communication, 2015); 2. Television should make better use of transmission network and receiving terminals that are the basis of television development in the context of triple play (The 13th China International Optoelectronic Expo, 2011); 3. About operation and management of television enterprises, they should follow the management mode with corporatization and commercialization and foster independent business entities and strength the cooperation with related companies (Yang & Zhou, 2015); 4. Legal guarantee and supervision system are indispensable (Li, 2015).

Another two points are very important to triple play and also to television that go through the whole thesis: technology and innovation. Digital technology, broadband technology and terminal technology will be more comprehensive and deeper (Zhao, 2011). The development and survival of connected TV will reach a higher level, new communication channels, new types of business and management theory will be accompanied by innovation. As long as the constant technical innovation, management innovation and system and idea innovation, the road of the development and survival of connected TV will be wider and there will be more space for the development of television industry.

**References**

Bao Zhidong (2010), “The Development Status and Influence of Triple Play”*, China New Telecommunications*, (4): 5-10 (in Chinese)

Bao Zhidong (2010), “The currently situation and triple play and its affect”*, Radio&Television Information*,(6) 16-19

Bobbie Johnson, *Vint Cerf, aka the godfather of the net, predicts the end of TV as we know it,* 27/08/2007, http://www.theguardian.com/technology/2007/aug/27/news.google

“Broadband China” strategy and implementation program, 2012(23)

Cao Sansheng (2011), “Trend Analysis of Triple Play Progress and Technology Development*”*, *Modern Communication*, (5):11-12 (in Chinese)

Sun Yang (2011) “China after determined the policy of triple play*”*, *Shanghai Journalism Review*, (1) （in Chinese）

Chen Peng,（2011), “In the context of triple play, the upgrade strategy of TV content industry*”, Television studies*, (1) 18-22

China Internet Netowrk Information Center(CNNIC) , (2015), “The 35th Statistical Report on China Internet User*”, China Internet Netowrk Information Center*

China Media Report , (2014), “Development Report of Radio, Film and Television in China”, *Social Sciences Academic Press*, page. 343

China Media Report, (2014), “Development Report of Radio, Film and Television in China”, *Social Sciences Academic Press*, page. 345

(2014) ,China Radio and Television Equipment Industrial Association, *General Information of television industry*, http://www.crta.com.cn/hyzhzx/32.htm

Chisholm, J. (2010), “The future is in the hands of journalist”, *British Journalism Review*, October, 20, vol. 21, nº3, pp.13-19. http://bjr.sagepub.com/content/21/3/13

Dai Lili,（2011）, “ Media Changes in the context of triple play ”*, Internet Communication,*(01), http://media.people.com.cn/GB/40628/13686470.html

Dai Weiping,(2010), “The development strategy of broadcasting network under the new circumstance of triple play”*, Cable television technology*, (11)

Dai Yuanchu,（2013）, “ Communication technology revolution and the change of platform value ”*, Youth Journalist*,(04), 13—15

Ding Li &Xu Jinyi, （2013）, “Research of the survival and development of Chinese television media in the era of new media ”, *Popular Culture& Arts*, 187—190,(02), （in Chinese）

Ding Yi&Zheng Xuan,（2010）, “ The current situation, problems and strategy research of triple play in China ”, *Modern Television Technology*,(11), 102-104

Dong Nianchu & Fanjie, (2006), “Mobile TV—the new challenge in media industry”*, Chinese journalists*,(04)

Dr. Valerie Feldmann, Mckinsey&Company (2005). *Leveraging Mobile Media—Cross-Media strategy and innovation policy for mobile media communication.* New York: Helmut Petri, pag. 9

Du Baichuan, (2009), “New generation of broadcasting network and triple play*”, Broadcasting Information*,(09)

Enfodesk, (2015), “Annual comprehensive report on Chinese online advertising market*”.*

Fanbin Zeng & Tianyi Wu,(2012), “Triple play and Interactive Digital Pay TV, journal of management and strategy”, Vol.3, No.4, (In Chinese)

Forward Business Information Co.,Ltd (2014): “China Tri-network Integration Industry Prospects and Investment Opportunities Analysis Report, 2013-2017 Shenzhen”,*Forward Business*

Fu Xuepeng, Peng jieying & Ren Tianzheng, (2010), “Analysis of the management system of Chinese broadcasting network in the context of triple play*”, Radio and Television technology*, (08)

Fu Yuhui, (2010), “The development trend of triple play in China: the change of pattern and the difficult of Institutional”*, Today’s Massmedia,*(3), 28-31

Gu Hong,(2010) , “In the perspective of industry, the evolution path and the core issue of the study of Chinese media convergence”*, International Press*,(03), pag. 45

Holt, J.; Perren, A.(ed.) (2009). *Media Industries: History, Theory and Method.* United Kingdom: WileyBlackwell.

Huang Chuxin, (2009), “The study on the development of IPTV in China”*, Modern Communication*,(05)

Huang Shengmin & Gu Hong, (2009), “Platform construction and competition in the digital media age*”*, *Modern Communication*,(05), 31—35

Huang Shengmin & Liu Shan (2011), “The Entire Media Marketing Construction Under the Triple Play*”, Modern Communication*,(1):31-31 (in Chinese)

Huang Shengmin& Liu Shan, (2011), “The construction of Entire Media Marketing in the context of triple play*”*, *Modern Communication*,(2). (in Chinese)

Hu Yong, Yang Huijun & Liu Wen,(2015) , “The new media under the development of triple play*”, Journalistic Front*,(02)

Ji Sheng, (2010), “China Network Television: Seize the Commanding Heights”, *News Front*,(02)

Jiang Hongbin, (2014), “Integration way of Broadcasting industry in the context of triple play”*, Broadcasting Realm,* 2014(6) http://media.people.com.cn/n/2014/0610/c385781-25129021.html

Jing Xiangxin, (2011), “ Content Services: Booster the development of “triple play” *”, Journalistic Practices*,(2), 46-48

Jing Xiangxin, (2011), *“* Content service promote the development of triple play *”, Journalistic Practices,*(04), pag. 25—27

Ke Lan , (2010), “Current Situation and Future Development Status and Trend”, *China Renmin University* (in Chinese)

Li Congjun,(2015), *Take the Road of Media Fusion and Leading New Information Communication Revolution—The National Committee of "promoting the development of traditional and emerging media integration" consultative forum on the excerpts,* The Chinese People's Political Consultative Conference News, 11/05/2015 http://www.cppcc.gov.cn/zxww/2015/05/11/ARTI1431304751452594.shtml

Li Junhui,(2015), “From 2G to 5G, there is a big revolution on communication technology”*, Intellectual property*

Li Liangrong&Fu Shengyu, (2011), “Triple play—new industry chain”, *Journalist*, (1), 3—1

Li Liangrong & Fu Shengyu (2011), “The Triple Play: to Create a New Output Value chain”, (1): 3-15 (in Chinese)

Li Qiang, Liu Qiang&Chen Yulin, (2013), “The impact of Internet on social areas and some policy suggestion”, *Beijing Social Science*,(1), 178—181 (In Chinese)

Li Yuandong, (*2014*), “The developing trend of the next generation of wireless radio and television”*,* (http://www.istis.sh.cn/list/list.aspx?id=8531) (in Chinese)

Li Yuandong,(2014) ,*Development Trend of Next Generation Wireless Radio and Television System*, http://www.istis.sh.cn/list/list.aspx?id=8531

Li Xinmin, (2006), *The Trend TV of China.* Beijing: Huaxia Publishing House, pag. 34

Li Xu,(2012), “Analysis of the Development and Industry Regulation of Broadcasting Industry”*, China Digital TV*,(06)

Liang Zhiyong, (2009), “A Compare Study of Media Group in the Context of Triple Play—As CCTV, SMG, Phoenix Satellite Television and Xinhua News Agency examples”, *Media Management*, (01) pag. 128—136

Lin Ying, Li Zhitao & Zhao Min, *A Study on transformation of Chinese TV digital and new media development,* Journalism Studies 01/28/2015, http://xys.sctv.com/yjcg/2013/201501/t20150128_2239053.shtml

Liu Dan,(2013) , “The development trends of digital television in the context of triple play”*, Practical Electronics*, (08)

Liu Hao,(2011), “Network communication strategy in the context of Fragmentation of context”*, Journalism Lover*, 24—27

Liu Junjie, (2011), “Strategy analysis of Chinese television business in the context of triple play”*, Broadcasting Information*,(03)

Liu Lianxi, (2007), “The First Decade of CCTV. com”, *China International Radio Press*, 63—64

Liu Lianxi, (2007), “The First Decade of CCTV. com”, *China International Radio Press,* 50—51

Liu Peng, Chen Qiang & Zhang Dong, (2011), “A study of multi business exploration of television in the context of triple play”*, Chinese Cable TV*, (09)

Liu Yinwu & Wang Li, (2012) , “The definition and interpretation of Media Fusion”, *Journal of Communication*,(03)

Liu Zhengyin, (2011), “The Continuously development in media fusion and creating greater glories”,(3), pag.1

Lu Dixinge, (2014), " Three options of profit model of China radio and business", *News Front,* 2015(2) http://paper.people.com.cn/xwzx/html/2015-02/01/content_1552704.htm

Ma Liying, (2013), "The opportunities and difficulties of television in the context of the new media", *Today's Mass-media*, 2013(11)

Maslow H.Abraham (1954), *Motivation and Personality*, New York: Longman

Nie Chenxi, (2014), "Grasp the two disciplines to promote the development of new and old media convergence", http://www.css-group.net/html/zhongwen/xinwenzhongxin/xingyexinwen/20141015/516.html)

NGB Committee of Experts, (2010), "Report of the study on the development strategy of independent innovation of China's next generation broadcasting network", *Science and Technology Department of SARFT*

Nigel Slack, Stuart Chambers & Robert Johnston, (2010), *Operations management,* 6ª.ed, The pitman publishing imprint, pag. 4-5

Pang Jingjun (2011), "Present situation and Development Trend of China Broadcasting Network", *Research*, (09)

Qin Yan, (2006), "Scientific and technological progress and the evolvement of media", *Science and Technology Management Research*,(11), pag. 49—55

Research Center for Media Development, Wuhan University, (2009), "China Media Development Report"

Research Group of News Study of Xinhua News Agency,(2010), "Report on the Development of China's Meida, Public Communication of Science And Technology",(02),pag. 81-87

Shen Shanzeng (2007), *Chong De Shuo*, Hunan: Green Apple Data Center, pag. 17

Sichuan Institute of Radio and Television Journalism and Mass Communication, *The convergence and development trends of new media and traditional media,* 01/28/2015 http://xys.sctv.com/yjcg/2011/201501/t20150128_2239072.shtml

Sino market research, (2015) (3) http://cn.sino-mr.com/share/3/100077Stan China, *Mobilized: The main orientation of media's change*, China Press and Publishing Journal, 2013 http://www.stanchina.com/cmlt-lxh1.htm

Sun Juan, (2013), "Because of the triple play, television will be able to call and surf the Internet"*, Zhengzhou Evening News*

Ta Na, (2010), "On Innovation of online video business model"*, The Press*, (5), 12-14

Tan Tian, (2015), "From the channel contention to win at the terminal"*, Journalist*, (06), 14—15

The State Council, (2010), " To promote the overall program triple play, the State Council, (5).

The State Council of the People's Republic of China, State Council Notice Concerning Issuing the "General Plan to Move Three-Network Integration Forward, 2010 https://chinacopyrightandmedia.wordpress.com/2010/01/21/state-council-notice-concerning-issuing-the-general-plan-to-move-three-network-integration-forward/

The 13th China International Optoelectronic Expo, 2011, Optical Communication Technologies Development Forum http://www.cioe.cn/cioe/img/2010%20%E5%85%89%E9%80%9A%E4%BF%A1%E6%8A%80%E6%9C%AF%E5%92%8C%E5%8F%91%E5%B1%95%E8%AE%BA%E5%9D%9B%E6%80%BB%E7%BB%93.pdf

Tian Jin, (2015), "Adapt to the requirement of the new situation and speed up the reform and development radio and television", http://www.sarft.gov.cn/art/2015/7/29/art_58_27585.html)

Triple Play Policy Report (2011), “Triple play policy to promote industrial development report”*, SARFT NET* (in Chinese).

Tu Changbo, (2011), “Laws and Policies on radio-visual new media, China Radio & TV Academic Journal”, (11)

Wang Chuanzhen, (2012), “An exploration of the development of Internet television business under the background of triple play”, *Broadcasting Information*, (10)

Wang Hongtao, (2007), “The current situation and prospect of the media convergence”*, Chinese Journalists*, 2007(06)

Wang Shengmin & Wang Wei, (2008), “Information platform—new breakthrough of digital TV operating mode ”, *Communication University of China Press*, pag.10

Wang Wei (2011), “Next Generation Triple Play Content in the Context”, *Modern Communication*, (5):6-8 (in Chinese)

Wang Wenbin, (2010), “Network TV station in China: the construction of three-dimensional communication platform”*, News Front*, (12), pag. 41-43

Wang Wenbin, (2010), “A New Strategic Concept and Practice of China Network Television”, *News Front*, 2010(02)

Wang Wenbin, (2015), “The Construction of New Media from Television”, *People’s Daily*,

Wang Xi & Fan Yijin, （2014）, “Value analysis of content in the context of triple play“*, Southern Media Rearch,* 2014(07) http://www.nfmedia.com/cmzj/cmyj/jdzt/201208/t20120802_356039.htm

Wang Xiaojie, (2014), “An Interpretation of Digital Technology and policy of CNTV“, *China International Exhibition on radio and TV Information Network*

Wei Kai, *The core technology and development trend of Internet Television in the context of triple,* The technology of Telecommunication, 2010(09)

Wang Wei, *The next generation of Content after triple play, Advertising Panorama,* 2010(06) http://media.people.com.cn/GB/22114/122162/196596/12081469.html

Wei Leping, (2010), "Four challenges and countermeasure of triple play", *Communication World*, (05), 25—29

Wu Gongyi, (2010), "The wisdom of the Internet of things—Technology in China and the whole world"*, Mechanical Industry Press*, pag. 57

Wu W.S Rechard & Leung L.K Grace (2012), "Implementation of three network convergence in China: A new institutional analysis, Telecommunications Policy", (36): 955-965

Wu Yuansong, Zhao Xiaoping & Dong Xue, (2013), "The strategy study of the business extension of television in the context of triple play"*, Television Technology*, (8)

Wu Yuling (2010), "In the Context of Triple Play, the Exploration and Enlightenment of Chinese Media Groups' Cross- Border"*, Press Circles*, (4) (in Chinese)

Xia Jian, (2011), "The application of modern optical fiber communication transmission technology"*, Information & Communications*,(4) 40—44 (in Chinese)

Xu Guofei, Shen Lianfeng, Lu Xueping & Yan Feng, (2010), " Current Situation and Future Development of Three-Network Convergence ", (3), pag.1-15

Yan Lin, (2012), " Countermeasure analysis of transformation of traditional television "*, Chinese Journalist*, (2), 13—17

Yang Mingpin & Zhou Jing, (2015), "The development marches of radio and television in 2014", *Journalistic Front*, (02)

Yang Mingpin & Zhou Jing, (2015), "The Development of Radio and TV Integration", *News Front*, (02)

Yi Shaohua, (2010), "Television's way to live: The studies of television's networked in the context of digitalization", *Xiamen University Publishing Company.* (in Chinese)

Yin Jun & Xu Lin, (2010), “The Development of China Network Television ”, *Media Watch*, (02)

Yin Yungong & Liu Ruisheng, (2015), “Annual Report on Development of New Media in China ”, *Social Sciences Academic Press*

Yu Yanzhi, (2010), “The development road of China Network Television”, *Voice and Screen World,* (05)

Zeng Fanbin & Wu Tianyi, (2012), “Triple play and interactive digital pay TV”*, Journal of Management and Strategy*, (4) 15-23

Zeng Jianqiu, (2010), “Network in the world—the theory of triple play, experience and information security”, *Beijing University of Posts and Telecommunications Press*, P12

Zhang Junjing & Xiong Ying, (2015),“Media is merging: Looking back to 2014 and looking far ahead to 2015”*, Northern Media Research*

Zhang Lining, (2013), “Development Mode of Internet Video Site ”*, Youth Journalist*, (11), 17-19

Zhang Renhan & Shi Yuantao, (2013), “A review of the study on the convergence of radio-visual new media“*, Journal of Zhejiang University of Media and Communication*. (06),21-26

Zhang Wei & Huang Weiqun, （2011）, “Study on Regulatory System of Broadcasting Network in the context of triple play ”*, Modern Television Technology*, (10)

Zhang Yixuan & Jin Liu, （2010）, “The era of the fifth media is coming? The media convergence become an inevitable trend ”, *People’s Daily.*

Zhao Zi Zhong (2011), “Key Perspectives of Triple Play: with Broadband Strategy Reading Triple Play”*, Modern Communication*,(6):42-44 (in Chinese)

Zhong Hong, Feng Qin & Yu Zhiqing, （2015）, “The Key Technology Analysis and the Constructions of Technology Platform of China Network Television ”, *Modern Television Technology*, 2015(02)

Zhou Hongze, （2005）, “Assorted Media Mix ”, *Economic Publishing House*, pag. 78

Zhou Yan (2011), “In the context of triple play, broadcasting how to deal with”, *Modern Communication*, (5): 6-8(in Chinese)

http://www.pptv.com/aboutus/en/

http://cctvenchiridion.cctv.com/ysjs/index.shtml

Zhu Jianfei & Guo Zhehan, （2008）, “A Discussion on System Transformation of China’s Media Industry“*, Broadcasting Realm*, 2008(10)

Zhu Jinyu & Wei Xu, （2010）, “Effect Analysis of Network Video Platform ”*, Journalist*, (04), 19-21

Zhu Tian & Peng Miyi, （2014）, “ “Discussion on the media fusion " way of addition and subtraction” , *Shanghai Journalism Review*, (04) http://journalist.news365.com.cn/xmtqy/201112/t20111207_884382.html

Zuo Hanying & Zheng Weidong, (2013), “The reconstruction of audiences and the transformation of media in the era of network”*, Broadcasting Realm*,(03), http://media.people.com.cn/n/2013/0723/c367107-22293723.html

**Appendix 1**

(Office of the State Council, China [2010] & Office of the State Council, China [2011])

The first phase of pilot cities of triple play in China:

In June 30, 2010, the General Office of the State Council announced the first triple play pilot areas (cities) as the followings:

The provincial capital, the capital, and some cities (12):

| | | | |
|---|---|---|---|
| Beijing | Dalian city,Liaojing province | Shanghai | Harbin city,Heilongjiang province |
| Nanjing city,Jiangsu province | Hangzhou city, Zhejiang province | Xiamen city, Fujian province | Qingdao city, Shandong province |
| Wuhan city, Hubei province | Zhutan Area, Hunan province | Shenzhen city, Guangdong province | Mianyang city, Sichuan province |

The Second phase of pilot cities of triple play in China:

In December 30, 2011, the General Office of the State Council released the second phase of pilot cities of triple play:

1) Municipalities (2): Tianjin, Chongqing.

2) Separately listed cities (1): Ningbo City, Zhejiang Province.

3) The provincial capital and capital city (22):

| | | | |
|---|---|---|---|
| Shijiazhuang City, Hebei Province | Taiyuan City, Shanxi Province | Hohhot City, Inner Mongolia | Shenyang City, Liaoning Province |
| Changchun City, Jilin Province | Hefei City, Anhui Province | Fuzhou City, Fujian Province | Nanchang City, Jiangxi Province |
| Jinan City, Shandong Province | Zhengzhou City, Henan Province | Guangzhou City, Guangdong Province | Nanning City, Guangxi province |

| | | | |
|---|---|---|---|
| Haikou City, Hainan Province | Chengdu City, Sichuan Province | Guiyang City, Guizhou Province | Kunming City, Yunnan Province |
| Tibet Autonomous Region—Lhasa City | Xi'an City, Shaanxi Province | Xining City, Qinghai, | Uygur Autonomous Region—Urumqi City |
| Yinchuan city, Ningxia Province | Lanzhou city, Gansu province | | |

4) Other cities (17):

| | | | |
|---|---|---|---|
| **Jiangsu province** | Yangzhou City | Taizhou City | Nantong City |
| | Zhenjing City | Changzhou City | Wuxi CIty |
| | Suzhou City | | |
| **Hubei Province** | Xiaogna City | Huanggang City | E'zhou City |
| | Huangshi City | Xianning City | Xiantao City |
| | Tianmen City | Qianjiang City | |
| **Guangdong Province** | Foshan City | Yunfu City | |

## Appendix 2

list of 39 local city satellite TV

| | | |
|---|---|---|
| Anhui satellite television | Beijing satellite television | Bingtuan satellite television |
| Chongqing satellite television | Dongfang satellite television | Dongnan satellite television |
| Guangdong satellite television | Guangxi satellite television | Gansu satellite television |
| Guizhou satellite television | Hebei satellite television | Henan satellite television |
| Heilongjiang satellite television | Hubei satellite television | Hunan satellite television |
| Jilin satellite television | Jiangsu satellite television | Jiankang satellite television |
| Jiangxi satellite television | Kangba satellite television | Liaoning satellite television |
| Tourism satellite television | Inner Mongolia satellite television | Ningxia satellite television |
| Qinghai satellite television | Shandong satellite television | Shandong education satellite television |
| Shenzhen satellite television | Shaanxi satellite television | Shanxi satellite television |
| Sichuan satellite television | Tianjin satellite television | Xizang satellite television |
| Xiamen satellite television | Xinjiang satellite television | Hongkong satellite television |
| Yanbian satellite television | Yunnan satellite television | Zhejiang satellite television |