

# A New Business Model of DBS Services in China

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**Abstract.** This paper discusses the new operating model of direct broadcast satellite (DBS), shifting from the "public service platform" to "public service platform + commercial operation". The Economics Empirical Research Methods were used to analyze the policy regulations, technical control, and market structure of the development of the Chinese DBS. The games of the DBS markets between State-Controlled and Copycat Brands were studied in the research of the "Every Village (Cuncun Tong)" project of DBS, specifically the competitive pattern of the DBS market. The results showed that China DBS market is a monopoly market in satellite TV services. DBS, digital cable and IPTV form oligopolistic competition pattern in the market of digital TV services. The proposed new operating model of DBS in this paper will transform the market of the government monopoly model into a market oligopoly. The proposed competition and cooperation strategies with local telecom or terrestrial TV operators will give DBS more advantages in the competition with cable operators in this duopoly market.

**Keywords:** DBS, Model, Services, Competition, Cooperation

## 1. Introduction

Direct broadcast satellite (DBS) is an advanced video compression technology and a perfect example of the successful combination of unlimited usage, low-cost and broad coverage. The essence of the DBS is to deliver TV signals directly to individual receivers through high-power direct broadcast satellites and small antennas of less than 60 CM in diameter. DBS, through individually selectable TV programs, will bring the greatest impact to the traditional TV industry. Great Britain and Japan are the two countries that have the most successful commercial operations of DBS. In US alone, there are over 30 millions DBS users, accounting for more than one third of TV users while in Great Britain, BskyB has over 10 million users. By 2009, the global users of DBS exceeded 140 millions, creating \$71.8 billion in revenue. Asia is the fastest growing region of DBS users, having 8 million users from 2008-2009.

From the beginning, the business model of international DBS services has been fee-oriented and profitability has been the main purpose. Because of the success of this model, global DBS services has flourished tremendously, particularly in Asia. In China, as a public service platform, DBS services started in 2008. China's own direct broadcast satellite "Every Village (Cuncun Tong)" provides free services across the country. In a short time periods, China has developed 13 million legal users and more than 40 million "copycat box", becoming the country with the largest DTH users.

Matured international DBS industries are mostly sustained by user fees. Pay TV's large capacity, with diverse contents, huge capacity and interactive services, the revenue of Pay TV will far exceed that of traditional TV advertising. With China's rapid development in DBS, promotions towards a better rural construction and the fact that incomes of farmers have increased rapidly, rural areas will emerged as the newest market for consumption of culturally informational products and services. In addition to been a public service, DBS has huge commercial and market potential in China.

Based on the competitive environments of the global DBS industry, services and commercial operation in combination with the problems that were encountered during the development of China's "Cuncun Tong" digital satellite TV, this paper will analyze the problem of re-defining China's DBS business model.

## 2. Review of DBS in China

### 2.1. The Relevant Policies of the Satellite Reception

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China's satellite policies have gone through a process of "strict control" to "gradual opening up". The loosening of the policies has provided the basis for the commercial operations of the DBS.

The Regulation 129 "Reception of Satellite Broadcast TV Regulation", issued by the State Council in October of 1993, states that all satellite receivers in usage must all be approved and regulated by relevant governmental departments and individuals are forbidden to secretly installed satellite receivers. All satellite receivers are under strict control.

In order to take full advantages of DBS's resources, technology and broad coverage and to improve TV coverage in rural and remote areas, the SARFT modified Regulation 129 in 2006 and started the DBS plan. So far, DBS is under the control of the Government. To eliminate areas without access to TV, the "Cuncun Tong" project is initiated and make into a policy. According to the whitepaper on "The Technology of China's DBS "Every Village (Cuncun Tong)" project", it is one of the important projects for the "eleventh Five-year" plan. The aim is to use satellite technology to expand the coverage of China's radio and television in rural areas, resolving the problem of villages having 20 households or more of having power but no access to television. The project will be a platform for public welfare, providing direct services for the development of the new socialist countryside. At this point, personal receiving satellite signals in China are legalized.

## **2.2. Development History**

China's DBS industry started as a public service "Cuncun Tong". Through over 40 million "copycat boxes", it has spread and expanded over a short period of time, providing a solid basis for the commercial operations of DBS. Due to the unsuccessful launch of China's first direct broadcast satellite "SinoSat II" in October 29, 2006, DBS has been postponed to June 09, 2008 when the "ChinaSat 9" satellite was successfully launched. A public platform "Cuncun Tong", DBS provide services - 48 TV channels and 48 radio broadcast stations - for the better construction of the socialist countryside using un-encrypted method of transfer. In December of 2008, the SARFT started the first phase of the bid for the "Cuncun Tong" project, calling for over 3.698 million sets of receiver. To stop the illegal "copycat boxes", the DBS was encrypted. In October of 2009, the second phase of the bid calls for CA solutions and 8.65 million sets of equipment while the third phase, in July of 2010, calls for over 650K sets. In total, all three phase calls for over 13 million satellite receiver, resolving the problem of not been able to watch TV in remote and rural areas.

The appearances and demands of over 40 millions "copycat boxes" on the black market have caused the "Cuncun Tong" project to have encrypted digital TV signals in the beginning of 2010, rendering these "copycat boxes" useless. Nevertheless, the rapid spread of these boxes indicated that DBS has huge business value.

## **2.3. Technical Solution**

From the start, China's DBS has used its own independent intellectual property, ABS-S. This new generation of satellite technology created a good foundation for the DBS's high-efficient transmission and broad coverage. Combined with NDS CAS system, used to deter the quick spread of the "copycat box" market, the perfect conditions are created for the commercial operations of DBS.

In 2008, the "Cuncun Tong" DBS project, using more efficient channel coding, independent intellectual property and advanced national standard ABS-S, was officially launched. China's "Chinasat 9" satellite has used four Ku-band transponders to cover 48 sets of SD digital TV channels at the same time providing data broadcast; electronic programming guide (EPG) and STB software upgrade. With the over-reliance on the ABS-S standard alone and the non-compatibility with other satellite signal technology, domestically made "copycat boxes" begin to appear on the black market after the localization of the receiver chipset. Therefore, at the beginning of 2010, the digital satellite signals were encrypted, prohibiting accesses by "copycat boxes". At first, encryption involved putting ABS-S into safe mode while the second phase involved using the NDS CAS system, effectively eliminating the expansion of "copycat boxes" finally.

## **3. A New Business Model of DBS**

During the SARFT meeting held on November 9, 2010, the issue of re-defining the current DBS business model is discussed. Since DBS is ready for commercial operation, it should be transformed from a

public service to a business-oriented service, using a profit model of “value-added services and subscriber fees” for digital TV operations. This new model will not only generate huge economic benefits and rapid technological and industrial developments, but also promote effective competitiveness within the industry, bringing profound changes to the industry as a whole and leading to a multi-level income-generating model in terms of advertising revenues, value-added services and subscriber fee. The commercial operations of DBS will also bring changes to the competitive dynamics of the digital TV markets as well as the telecommunication market, which will, to a certain extent, promote the progress of triple-play.

### **3.1. The System of Commercial Operation**

Using a hierarchical company structure where the central Government’s responsible for each province and each province is responsible for each cities and so on, a business model of “public service platform + commercial operations” and the promotion of using ABS-S and AVS codec standards, the transmission and broad coverage of hundreds of SD digital TV programs can be achieve once 18 of “Chinasat 9” satellite’s free transponders have gradually been put into commercial operations.

All DBS operators will be grouped and operated by a company set-up by the SAFRT for providing unified channel integration, content classification, operation, and user managements. The requirements for the quantity and quality of DBS programming are very high. If there’s no irreplaceable or pay-per-view contents, then it’s impossible to achieve commercial operations. For example, Great Britain’s BSkyB has provided over 200 speciality channels that target various segments of the public, thus achieving great commercial success.

The establishment of each county (city) as the basis level in forming the DBS Company will be responsible for customer development, STB sales and technical support. This model of no intermediary company structure will improve the efficiency and the enthusiasm of services as well as play an important role in promoting the development of the DBS market. Due to the facts that digital cable TV operators are not directly responsible in the promotion and services of DBS and the operations of DBs will affect its overall profitability, these cable operators will use various means to inhibit the operations and the advantages of DBS, and then effecting DBS’s growth and development. Therefore, the cable operator is the competitor of the DBS and not the co-operator.

The “Cuncun Tong” project used only 4 of “Chinasat 9”’s 22 transponders. The remaining idle transponders can be used to provide transmission and coverage of hundreds of digital TV programming, forming a new competition for digital cable TV and terrestrial TV. DBS can use the model of “public service platform (free) + commercial platform (paid)” to effectively promote the rapid occupation of the market. As an example, India’s national TV station, as a later comer of DBS, had quickly taken over India’s TV market by providing 59 TV and 21 radio channels for free in addition to 35 premium paid channels.

### **3.2. STB Deployment**

Satellite receivers will act as the terminal, a crucial component, in the commercial operation of DBS. The cost, quality control, selection and sales patterns of the receiver will also play an important. The Government has already approved retail sales of DBS STBs through channels such as county (city)-levelled DBS companies or home appliances stores with technical services provided by the DBS companies. Given the sale of over 40 million “copycat boxes” in the past couple of years, there are plenty of experiences available on how to promote and deploy satellite receivers commercially.

In addition, similar to what the cable TV industry has done, complimentary satellite receivers can be given to users while the cost can be covered by bank loans and recovered through monthly rental fees.

### **3.3. “Subscriber + Value-added Service” Mode of Billing**

Besides providing some public services, the commercial operations should follow market regulations, industry characteristics and consumer needs, providing “Subscriber + Value-added Services” mode of billing. Subscriber fees should be determined by the various service packages while the value-added charges should be in accordance with the services provided.

- Basic monthly plan: Providing users with the basic 48 digital TV channels while ensuring that this service is free for those under the “Cuncun Tong” project (either through a rebate or governmental subsidy). Taken into consideration the models of already successful commercial operations and the current situations in China, the charge for “subscriber” fee should be around two US dollars.
- Customized monthly plan (basic channels + other selected channels): This plan will include the 48 basic channels plus whatever other selectable channels, such as HD and pay-per-view channels (CCTV 3, 5, 6, etc) that the users has chosen. Users can either pay for a packaged deal or individual channels (premium), the price of which will depend on the quality of the content.
- Value-added services: Users are been charged an extra fee for services provided outside of the regular TV viewing service, such as program pre-recording, program information, banking, games, distance education and on-line shopping. Value-added services are another way for the DBS to make a profit. Combined with broadband networks, exciting contents and services can be introduced through the launch of interactive TV and Internet services, achieving win-win cooperation.
- Cooperation with terrestrial TV to provide local TV and interactive services can also be part of the value-added services. In China, the scarcity of high-quality original programming in open channels when combined with the cooperation of digital TV can greatly meet the demand of the market.

### **3.4. Selection of the Technology**

The “Chinasat 9” satellite has enough power to cover most regions of China. DBS signals can be received by using a 40 cm satellite antenna. With the aims of high efficiency, low cost and stable operations, the technical aspects of the DBS operations will mainly take into consideration of the technical problems related to satellite standard, video compression, CAS and value-added middleware.

#### **3.4.1. The Satellite Standard**

The commercial operations of DBS will continue to use China’s own ABS-S standard, a standard that has the same performance as or in some parts better yet simpler than the latest generational of DVB-S2 standard. Already used for large-scale applications and forming its own industrial chain, this standard is very advanced and reliable. Under 8 PSK, the ABS-S standard can provide symbol rate of 45 Mbps and a net rate of 120 Mbps. It can also allow the four existing transponder to provide a net transmission rate of 480 Mbps.

#### **3.4.2. Video Compression**

The “Cuncun Tong” DBS uses MPEG-2 video compression technology instead of the advanced high compression H.264 or AVS standard. Since AVS is a Chinese standard and has ready been widely used in terrestrial TV, it is proposed that the commercial operations of DBS use this standard because it can provide the same video quality and compressions efficiency as the advanced H.264. By providing 1.5 Mbps of SD TV programming and 8 Mbps of HD TV programming, this standard can fully satisfy the streaming requirements of DBS. The combination of the ABS-S and AVS standards provides a new generation of DBS transmission capability that can allow four transponders to transmit and cover over 200 channels of SD TV. For the commercial operations of DBS, this combination will have huge economical benefits but it not only save the cost of transponder rentals and maintenance fees, but also billions in licensing fees.

#### **3.4.3. CAS**

Encryption, for digital TV, is an important mean of providing secured broadcast and commercial operations. DBS uses encryption to achieve commercial operations and billing management based on services. The introduction and the choice of NDS CAS system was a lesson learned from the expansion of “Chinasat 9” satellite’s “copycat box”. As the first network security solution introduced by CCTV digital TV, NDS has proven maturity and experience in providing to millions of users. But, the monopoly position of NDS increased greatly the cost of the satellite receivers. Therefore, in the new business model, similar CAS encryption technologies solutions, such as Irdeto, Conax, Via Access, and China’s own matured proprietary CAS, should chosen.

#### **3.4.4. Middleware**

Middleware is an effective way to provide better DBS services and enhance user experience thus generating greater profit. However the use of middleware will require an increase in the calculation power of the chipset, causing the cost of the DBS receiver to increase. Therefore, when choosing the appropriate middleware technology, application services, user experiences and cost of receivers will all need to be taken into considerations.

### **3.5. Competition and Cooperation**

The problem of competition and cooperation arises from the pursues of profitability by DBS digital TV, cable TV and terrestrial TV while at the same time the need to cooperate with each other. On the one hand, the commercialization of DBS means that DBS has gone from the role of supplementary TV coverage and public services to an era of commercial operations, competing with cable and terrestrial digital TV for the share of the market. On the other hand, due to the method of DBS coverage, only a certain number of programming, such as CCTV, provincial stations and major media organized programming, can be provided while a large number of local programming cannot be delivered by satellite to local users. In order to have the ability to provide these programs, cooperation with terrestrial TV is needed. In addition, in order to realize triple-play and the advantages of low cost and quick deployment between the cooperation of DBS and the Internet, the problem of competition and cooperation will, without a doubt, exist when DBS and telco operator have to work together. Thence, an in-depth game study of the problems of competition and cooperation between DBS and cable TV will provide important insights into the commercial operations of DBS.

## **4. The Analysis of the Market and the Competition**

### **4.1. The Size of the Market**

China has over 400 million TV users including 168 million cable TV users which include 100 million households had used the digital cable TV services. There are still around 250 million TV users who have no cable and have to use the satellites and terrestrial TV. The majority of the population still lives outside the wealthier, more densely populated coastal crescent (an area running from Beijing down the coast to Guangzhou). Here cable is dominant. There are about 350 million people there, so by implication, there are about 1 billion people outside that area. It is less easy in the more urbanized areas of Chinese cities where there are large numbers of [multiple dwelling units] to place dishes, causing a logistical limitation together with greater competition from cable and IPTV. Taken into consideration that about 10% of cable TV users has switched to DBS, the huge invested involved in the development of terrestrial TV and the ambiguity of the profit that restrictiveness of the market, China's DBS will cover over 270 million users, forming a huge market. If each satellite receiver can sell for an average of 40 dollars, plus an annual charge of around 20 dollars, then with hardware alone can amass over 10 billion dollar and the total annual charge of over 5 billion dollar. Consider all the other revenues and benefits such as advertising, DBS can produce up to a hundred of billions of dollars, stimulating GDP and contributing to the digital TV industry as a whole.

DBS digital TV can cover a wide range of areas while maintaining low cost and quick deployment. It will not only dominate remote and rural areas but also certain suburban areas, competing with digital cable for market shares. For example, in Shijiazhuang, the capital city of Hebei province, there are over 530 thousand cable TV users. During the conversion to digital TV, there are only 400 thousand users left and around 50 thousand became the DBS users.

### **4.2. The Competitiveness with Digital TV**

The commercialization of DBS and the digital cable television have formed a competitive relationship. Inevitably, DBS has brought about the segmentation of the digital cable market, causing a huge impact. Unfortunately, this competitiveness is unavoidable for the intersection of DBS and digital cable. For the longest time, only allowed one cable operator in one city, digital cable TV really didn't have any competitors. The emergence of DBS broke this state of operations while activating and promoting the development of the overall market, creating a duopoly market with cable TV. On the one hand, the formation of a duopoly avoids disorderly competition as well as decreasing the waste of resources. On the other hand, duopoly can

avoid the monopoly of a single brand, creating competitiveness with the development of the industry. DBS and digital cable TV will compete under a fair and reasonable competitive industrial environment, offering more options for the users to choose from. DBS's global coverage and the options of more contents can be direct alternatives to what cable TV has to offer. Having a huge advantage over cable TV in the countryside, DBS could be an effective way to bring digital TV to remote rural areas. Therefore, DBS operators need to suppress the development of cable TV in rural areas. Additionally, through lower fees and charges, DBS operators can attract cable TV users in urban areas to switch to DBS due to the fact that given the same quality and quantity, users will choose the products or services with the lower costs. By using a satellite TV receiver, satellite TV has already entered the household. Without a doubt, China's DBS will enter the urban market eventually, forming a huge impact on the cable market.

Regarding the state of cable TV's monopoly of the market, a duopoly can only bring benefits to the users. Under the pressure to attract more users, cable TV operators will attempt to lower price while increase the variety of its programming. The differences between DBS and cable TV technology will not become a factor in this competition. Price, the attractiveness of the content and the quality of service will determine who will triumph. Let us hope that these two competitors can create better mechanisms to improve the market.

### **4.3. The Competition and Cooperation with Digital Terrestrial TV**

The competition between DBS and terrestrial TV will, without a doubt, inhibit the development of terrestrial TV. Because terrestrial TV is needed to provide local TV content, the cooperation exists between DBS and terrestrial TV, thus forming a competition and cooperation relationship. Since cable TV has taken up most of the market share in urban areas while DBS has most of the rural markets, there is nearly no rooms left for the terrestrial TV. Even though DBS has many contents, it could not provide local programming. Terrestrial TV is the best answer to DBS's local programming problem. Cooperating together, DBS has the advantage of broad coverage while terrestrial TV has the advantage of providing local programming. Dual-mode STBs or dual-mode TV receivers can be manufactured to receive both terrestrial and satellite signals.

Another factor pushing for the cooperation between DBS and terrestrial TV is the local radio and television sector of SARFT. As for the local radio and TV departments, once the cable TV networks has been "integrated" and controlled by national cable company, will it be involved and obtain the rights to operate DBS locally, pitting DBS against cable TV? There already are some precedents. Some counties and cities have already been "integrated" into the provincial networks while still being able to operate their own local terrestrial TV services. Therefore, the business model of cooperation between DBS and terrestrial TV is greatly welcomed by the local radio and TV sector.

### **4.4. The Competition and Cooperation with Telco Companies**

An important focuses of trip-play has been the integration of telecommunication (telco) and broadcast TV services. Through the bi-side opening policy between the two parties, cable TV operators has obtained some of the broadband and voice services users who were once telco users while telco operators started providing new media services. Through triple-play, telco operators are competitors of DBS but the low cost and quick deployment advantages will compliment nicely the high-cost of deploying HD TV and broadband network transmission.

In the triple-play competition, when faced with highly personalized and interactive programs as well as variety of exciting value-added network services, DBS lacks the needed return path and there is nothing that DBS can do about it. In cooperating with telco operators, DBS can provide hybrid and triple-play services, providing interactive TV and value-added services. Since the advantages of DBS will make up for the shortfalls of telco's IPTV services, the hybrid terminals, made up of STB and broadband networks, can provide great triple-services and will be the determining factor in the race between cable TV and IPTV.

Telco operators view cable TV as its competitor while DBS as its partner. With the point of view of competition and cooperation, DBS and telco operators should work closely together to provide bundled sales and services support.

## **5. Conclusion**

Through the analysis of transforming DBS's business model from a "public service" platform to that of a "public service + commercial operation" platform, the authors recognized that DBS has tremendous commercial and market potentials. Checking the promotion of the "Cuncun Tong" project and the spread of the "copycat box" in the market, we found that the commercial operations of DBS is ready in policies, technologies and market environments. The opportunities to promote the commercial operations of DBS in time will bring the historical chance to develop China's DBS. Creating, at the same time, duopolistic competition with cable TV, the commercial operation of DBS can effectively promote the developments of China's triple-play and information industries.

During the study of the new business model of the commercial operations of DBS, the authors pointed out that the "public service+ commercial operation" platform of DBS will have annual revenue of tens of billions of dollars and with a market share of over 270 million users. They also suggest using the model of "Subscriber + Values-added" service charges for successful commercial operations. After the analyses of the competitiveness between DBS and cable TV, DBS and terrestrial TV and DBS and telco operators, it is found that DBS and cable TV are in a duopoly competitive relationship. While inhibiting the development of terrestrial TV, DBS needs to cooperate with it in order to provide local TV programming, thus forming the competitive and cooperative business model. For the triple-play services, DBS also needs to cooperate and compete with telco companies.

In conclusion, the advantages of low cost, quality contents and quick deployment have achieved great global market success in the commercial operations of DBS. In China, the radio and TV departments, who operate and control the operation of DBS, still want protecting the profitability of cable TV, it is very difficult to achieve fierce competitiveness similar to what's happening in the US market. Hopefully, with the new business model of commercialization of DBS to be accepted, it will be the beginning of the gradual shift to complete openness for the DBS market.

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