The Research of Mobile Satellite Broadcasting Communication Business Model

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Abstract: The same cost curve for mobile multimedia business realized by satellite mobile broadcast and 3G mobile broadcast on demand is analyzed in this paper. The business characteristic curve decided by business redundancy and business user number should be obtained before the mobile multimedia broadcast business is operated by the operator. This operation idea is first presented in this paper, and the different scope of application for the two implementation model is presented under different business type.

1 INTRODUCTION

SATCOM is a kind of communication method using the artificial earth satellite as a relay station to communicate with two or more earth states by transmitting radio wave. with advantages of large coverage (a geostationary satellite can cover a third of surface of the Earth), the distance no longer influence the cost of construction and communication of relay stations, short open time of the station without restriction by geographical conditions, SATCOM is especially suitable to meet the requirement of broadcasting communication business.

According to the receiving modes of terrestrial satellite receiving terminal, the broadcasting satellite service can be divided into two parts: one is fixed broadcast, the other is mobile broadcast. As same as the fixed broadcasting services, Mobile satellite broadcasting carries multiple operations, including video, audio and data broadcasting etc. and there have been some successful attempts internationally.

Interiorly, based on the mobile multimedia broadcasting services of CMMB technology systems which is independently researched and developed by China, it has been set in 215 cities. Since the original S-band broadcast satellite has yet not been launched, now the domestic mobile terminal receives the signal mainly through the High-power ground transmitting station broadcast directly. As a complete system, CMMB will not become a Mobile Multimedia Broadcasting Network which really covers the whole country unless the air-ground broadcast mode has been built. before the satellite prepared, Whether the satellite mobile broadcasting services are able to succeed in China, it also needs relevant Business operation units to conduct research and exploration (Heping Ma, Fang Yuan; Silin Liu, 2008).

With issuance of 3G licenses in China, the three domestic major communications operators are beginning large-scale construction of 3G mobile communication network. Mobile multimedia services, which thought to be important services in 3G communication age, will certainly be the primary focus of communications operators. Different from broadcast services, mobile networks have features of bidirectional communication. 3G mobile multimedia services is basically based on demand to realize (Siau, Keng; Ee-Peng, Lim, 2001) .

This paper analyzes the operational costs of mobile multimedia services in both Satellite Mobile Broadcasting services and 3G network on-demand services, indicates the applied scope of two ways, and gives some suggestions about operating model of satellite mobile broadcast services.

2 ANALYSIS OF OPERATING MODEL OF SATELLITE MOBILE BROADCAST SERVICES

2.1 Analysis of the Business Cost

Since the satellite mainly cover the unblocked outdoor area where mobile multimedia services can be applied, the outdoor users will receive satellite broadcast signal and 3G network signal simultaneously, therefore the analysis is mainly based on outdoor users. And the cost of building terrestrial broadcasting system is ignored in this paper.

Due to the characteristics of broadcast service, a certain type of broadcast service for example TV service, Systems needs to send multiple different source information, while to one user, it only takes one of them at a certain time. The other system information is redundant. In the way of Satellite Mobile Broadcasting, if the terminal cost is ignored, the operating costs of mobile multimedia services are

$$C_B = n \times B_1 \times c_1 \qquad (1)$$

C_B is the operating costs of satellite broadcast mobile multimedia services.

n is business redundancy rate, its definition is: to a certain type of broadcast service, at a certain point in time, the ratio of total information system sends and the useful information a specific user needs. for example, if the system send 3 TV signals, n=3.

B_1 is bandwidth which a certain Mobile Broadcasting multimedia services needs. For example, broadcasting one way service data information needs bandwidth of 128kbps.

c_1 is unit cost of a certain mobile broadcasting multimedia services bandwidth. That's how much broadcasting 128kbps data information will cost within 1 way bandwidth. Since the satellite has not been launched, its value refers to foreign satellite market rented prices.

In the way of 3G network-on-demand, the operating costs of mobile multimedia services is

$$C_{3G} = U \times B_2 \times c_2 \times \rho \qquad (2)$$

C_{3G} is the operating costs of 3G network-on-demand mobile multimedia services.

U is the number of users of this service in 3G network.

B_2 is bandwidth which a certain Mobile Broadcasting multimedia services needs. For example, demanding one way service data information needs bandwidth of 128kbps.

c_2 is unit cost of a certain services bandwidth. Which is the cost of 3G that a bandwidth of 128kbps data information.

ρ is services concurrency probability, showing that the ratio of users using the service and all the users in the coverage area.

When $C_B = C_{3G}$, it can deduce the equal cost curve of two ways that offer mobile multimedia services. The bandwidth of per way service is set to 128kbps, c_1 and c_2 refer to current market price. we can get that the applied scope of Satellite Mobile Broadcasting and 3G-on-demand is showed as follow:
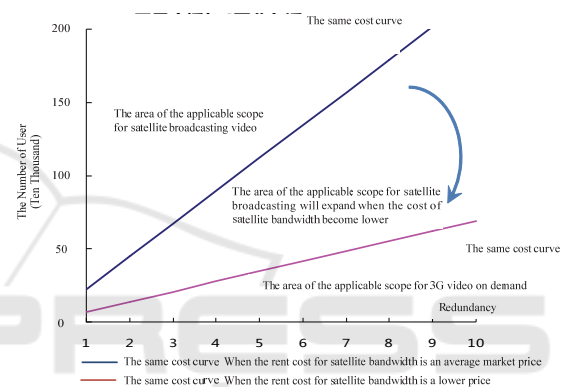

Figure 1: the applied scope of Satellite Mobile Broadcasting and 3G-on-demand.

According to the above picture, the following conclusions can be drawn:

(1) The lower the redundancy of the kind service is, the more users the service will attract. And the area of applying satellite broadcast is much wider.

(2) When getting satellite resources at below-market price, Satellite broadcast will be more valuable.

Any text or material outside the aforementioned margins will not be printed.

2.2 Suggestion about Choices of Satellite Mobile Broadcasting Business Platform

According to the results of above analysis, there exists competition between Satellite Mobile Broadcasting services and 3G network-on-demand. Whether the costing advantage of Satellite Mobile Broadcasting Services exists, that is associated with its redundancy and numbers of user. Business

characteristic curves of the redundancy and numbers of users are shown as follow:
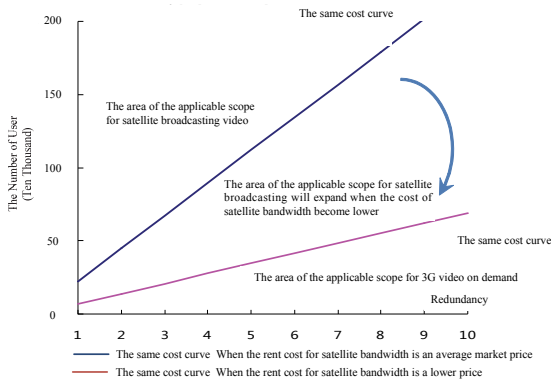

Figure 2: The first class of business characteristic curve.

According to the first class of business characteristic curve of above picture, we can get: business A is only suitable for mobile networks-on-demand, business B is only suitable for satellite broadcasting.
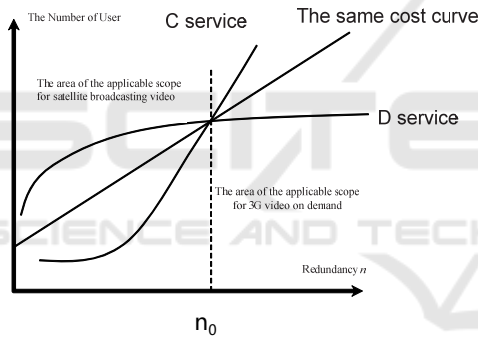

Figure 3: The second class of business characteristic curve.

According to the second class of business characteristic curve of above picture, we can get: to business C, when business redundancy is less than n_0, it is suitable for mobile networks-on-demand. When business redundancy is greater than n_0, it is suitable for satellite broadcasting to business D; when business redundancy is less than n_0, it is suitable for satellite broadcasting. When business redundancy is greater than n_0, it is suitable for mobile networks-on-demand.
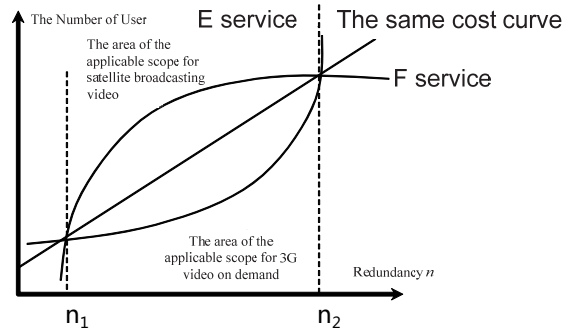

Figure 4: The third class of business characteristic curve.

According to the third class of business characteristic curve of above picture, to business E, when business redundancy $n_1 < n < n_2$ and less than n_0, it is suitable for mobile networks-on-demand, for all other situations, it is suitable for satellite broadcasting. To business F, when business redundancy $n_1 < n < n_2$, it is suitable for broadcasting, for all other situations, it is suitable for mobile networks-on- demand.

2.3 Suggestions about Business Operating Model

It can be seen from the above analysis that before operators operate satellite broadcasting business, it is necessary to consider that competitors may offer the same services through mobile network-on-demand. Since the above three kinds of business characteristic curves all are forecasts, if we want to get the actual business characteristic curves, we should adequately research the market analysis and measurement for the cost, redundancy rate ,user amount of target business, and choose the most suitable platform based on the final result.

3 COMPLIMENTARY CLOSE

Satellite Mobile Broadcasting services may be a new communication business model in domestic market. Because of the competition with 3G mobile multimedia services, operators should figure out business characteristic curves of this service. In order to instruct the development of business content and construction of business platform, operators should also analyze the interval of business redundancy rate which is needed to realize the service.

ACKNOWLEDGEMENTS

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