

DMB Market in Korea: Service, Device and the Future

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1. Environment Analysis

DMB market can be divided into external environment and internal environment surrounding T-DMB and S-DMB. External environment includes global and domestic environments, traditional broadcasting technology-based environment, and internet-based environment while internal environment consists of broadcasting service providers, communications service providers, device vendors, mobile broadcasting service players such as Contents Providers(CP) and Service Providers (SP).

Competition structure among players in this mobile environment is explained in the following.

With the initiative of the government, parties from Industry-Government-Academy participate in developing technologies and projects. MBC, KBS, SBS, YTN, U1 Media, and Korea DMB are participating in the Korean terrestrial DMB service and these Korean players compete with MediaFlo led by Qualcomm and DVB-H led by Nokia in the global market.

The Korean satellite DMB service competes

with Japanese and European DMB services in the global market. Considering that S-DMB service requires expensive satellite, the competition in the S-DMB is less fierce, compared to T-DMB. Currently, Korea and Japan are the only countries which launched mobile TV broadcasting service. As S-DMB service is expanding in the global market, it is expected that competition for related devices and contents are going to be much fiercer than competition for technologies and services.

As for the external market environment of the Korean DMB industry, there are communications and internet technologies-based services which enable mobile TV broadcasting service and can be the possible competitors of T-DMB and S-DMB services. HSDPA (W-CDMA)-based Multimedia Broadcast Multicast Services (MBMS) and WiBro-based mobile IPTV services have a technology replacing DMB service and these two services are expected to be launched in Korea in 2006.

In the internal market environment of the Korean DMB industry, broadcasters, communications providers, device vendors, CP/SP, other players cooperate and at the same time compete with each other.

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The characteristics of the Korean DMB market can be summarized as follow: First, as the first mobile multi-media broadcasting service, the Korean DMB service is in the process of the full pledged commercialization among other next generation transmission media. Second, the Korean DMB service can lead the global market in terms of technology and market aspects. Third, due to the characteristics of broadcasting service, the DMB service attracts much attention from the government, related providers, and users. Fourth, we can see dynamic movements among market players and policy trends of the government. In short, governments and related providers at home and abroad pay keen attention to the movement of the Korean DMB market. We believe that the Korean DMB service market can serve as a case study material to various players planning mobile TV service.

1.1 Business Model of T- DMB

T-DMB, itself has advertisement revenue only. That is why some IT or industry specialist forecast the T-DMB service's uncertain future. However, this could be changed when the T-DMB service continues. T-DMB can create the new business sector combine with other IT related industry. This can be the expansion of contents industry through increasing demand of DMB contents, also the broadcasting station and network equipment which create the DMB signal and send. In addition, new advertisement market will be created. However the most expected economic effect is the handset such as, motor, notebook, PC, USB and more handsets can be released. The DMB handset market in 2010 will be 12 billion dollars by production activity and 5 billion dollars by value added. Secondly, the new

business model by communication and broadcasting emerging can be expected via T-DMB service. Existing broadcasting service send contents only, but T-DMB's contents are sent off wireless handsets and notebook which are high-tech contained, so it is easier to provide the service that is communication and broadcasting emerging. The new service could be VoD, T-Commerce, traffic information and so on. These new services can be used popular because of the services' usefulness and profit insurance for operators. Moreover, the combine fields can be extended to WiBro, HSDPA and telematics which are new IT technology with the advantage of anyplace usable, high speed contents sending and receiving. Finally, the world first launched service DMB could be high valued in the overseas. T-DMB is adopted by ETSI (world standard association for electronic communication) for movable TV broadcast standard and Germany, China, England, France and Mexico embark on an experimental broadcasting service. Especially, T-DMB service will start to be informed in earnest via global sport events in Germany and China which are host countries of 2006 World Cup and 2008 Olympic. The other side, Korean T-DMB service obtains the distinct competitive power and technology trust as the first released on the market compared to DVB-H (European movable broadcasting) and MediaFLO (Qualcomm's movable broadcasting). In addition, T-DMB has not only the profitability point's advantages but cultural side as well. T-DMB possesses the various information fields but it is free to users. This means people of every class (of course people in the low income bracket included) get the high tech benefit easier and less defrayment than existing service (DVD service in the early period, PS2 or 3 and more services

which is priced at high point when the services launched).

T-DMB can not be valued only itself but T-DMB should be valued all the possibilities and combination with existing technology and service. T-DMB, itself, has only advertisement revenue for operators but the profit will amplify when the service added other tech or service.

1.2 Convergence Device

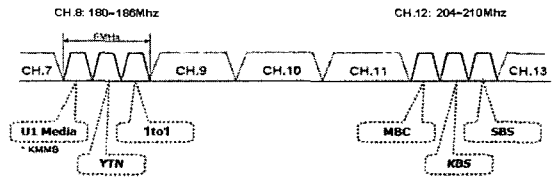
As for DMB Device, combined forms with various devices such as mobile phone, telematrix, PMP, PDA, and laptop are the mainstream, rather than DMB exclusive devices. Mobile phone-type T-DMB phones embedded with communications chips are the most popular among Korean users. Three domestic major mobile phone makers, Samsung Electronics, LG Electronics, and Pantech&Curitel, introduced various mobile phone-type devices. Device convergence combining the existing devices with DMB features becomes a major trend. Based on this, the convergence between S-DMB and T-DMB, DMB and WiBro, and DMB and HSDPA devices are increasingly prevalent.

1.3 Frequency

T-DMB has the frequency band of 12Mhz. Among T-DMB providers, U1 Media, YTN, and KDMB shares the frequency bands of 180~186Mhz (CH.8) while MBC, KBS, and SBS use 204~210Mhz (CH. 12). As for S-DMB, TU Media uses 25Mhz from 2630 to 2655Mhz to provide broadcasting service. The Korean DMB service providers get a frequency band allocated by the government and pay fees to provide the service. In Korea, the government and various

business players already use most frequencies and there are only few usable frequencies left. Accordingly, it is not easy that businesses requiring new frequencies enter the Korean market, based on the assumption that there would be no readjustment of frequencies by the government in the near future. In addition, MediaFlo and DVB-H, competitive technologies of the Korean DMB, are expected to experience difficulties entering Korean market for now.

(Figure 1) Channels and Frequency Bands Used by T-DMB Service Providers



Source: ROA Group summarized it based on the industrial reference.

1.4 DMB Technology

One of the most distinctive factors of DMB service from the existing broadcasting is that DMB allows users to enjoy broadcasting service while on the go. Since users receive broadcasting through a mobile device, a DMB device is different from the existing fixed devices and voice communications devices. Thus, DMB technologies have the distinguished characteristics below, compared to the existing broadcasting and devices.

- Efficient transmission system
- Minimum power consumption
- Realization of single frequency
- Interactive service
- Stable reception while on high-speed transit

Those characteristics have come from a set of criteria to establish the suitable environment for

portable and mobile broadcasting services through using the existing communications and broadcasting technologies. In the end, the technologies of DMB, communications/Broad

casting convergence service, are developing in a way of preparing the environment suitable for portability and mobility, new technical issues of the convergence between communications and broadcasting. To this end, the quality of the common technology characteristics mentioned above should be enhanced.

A Conditional Access System (CAS) for T-DMB is currently being evaluated, in order to consider the possibilities of providing pay subscription based services in the near future. For instance, in China, several CAS solutions are currently being evaluated and tested.

Specially, in Beijing, the Beijing Jolon Digital Media Broadcasting Co., the T-DMB service provider in this area, is considering the solution from a Korean CAS solution provider.

T-DMB Middleware for Data Broadcasting Service software module to provide data service on DMB terminals. By selecting combination of layers and components, it is possible to set up a system optimized for chosen platform while meeting flexibility and service level requirement.

2. Development Status and Outlook of Service

2.1 Development Status of DMB service

Since Terrestrial and Satellite DMB services have been launched in 2005, a variety of operators are carrying out these services. What is mentioned below is classification of operators providing DMB service and current business situation of each operator.

2.1.1 DMB broadcasters

Out of currently six permitted T-DMB operators, five of them, except Korea DMB, have started commercial service in metropolitan area in December 2005. In an attempt to obtain good competitiveness against S-DMB and garner more users, T-DMB service providers are touting the benefits of free service and re-transmission of Terrestrial TV contents.

They are putting a great priority on removing shadow areas and providing stable service while preparing to launch nationwide service. Plus, by focusing on portability and mobility of DMB service, they are being committed to not only re-transmitting Terrestrial TV programs but also developing contents and specialized service suitable to DMB.

TU Media, the sole operator of Satellite DMB, has succeeded in securing a total number of 370,000 subscribers (as of January 3, 2006) after the launch of commercial service in May 2005. However, it is now confronting difficulties triggered by the ban on re-transmission of Terrestrial TV programs and the launch of Terrestrial DMB service. In addition, it is expected to face uphill battle due to the commercialization of IPTV and HSDPA followed by the commercial launch of WiBro within 2006.

2.1.2 DMB device manufacturers

DMB device manufacturers are focusing on developing devices with more than two functions such as Terrestrial DMB, Satellite DMB, WiBro and HSDPA. Furthermore, they are striving to facilitate portability of devices through developing power-saving and small-sized devices. They are also making every effort to develop devices that can correspond to various circumstances.

2.1.3 Distributors

Currently, DMB devices are being distributed through the existing distribution channel by mobile operators, which take charge in distribution of mobile phones and other manufacturers, which distribute portable handsets except mobile phone. Especially, the distribution is mainly led by mobile service carriers releasing devices combined with mobile phones preferred by customers.

2.1.4 Contents providers

Contents providers of T-DMB are considering producing unique contents suitable for DMB and reusing existing mobile and broadcast contents. As for S-DMB, TU Media is providing DMB contents through its own contents development process and is also reusing existing mobile and broadcast contents.

However, under the situation where Interactive Data Service is slated for commercial service in

2007, it is expected that contents providers of both S-DMB and T-DMB have to be committed to developing suitable contents.

The following table shows the current business situation of DMB service and its future course of direction.

2.2 DMB Contents Service

2.2.1 Supply and demand strategy of contents and its directions of T-DMB operators

Currently, Terrestrial DMB service is offered at no charge, allowing users with DMB device to freely watch TV programs on their handsets. T-DMB service is being provided by 6 operators including Korea DMB, whose service started in March 2006. A total of 7 video channels, 13 audio channels and 8 data channels are run by T-DMB operators.

(Table 1) Development Status of DMB Service

Date	Details
2005.01.13	Plan to select T-DMB carriers announced by Korean Broadcasting Commission (KBC)
2005.01.14-02.14	Applications to obtain the license for T-DMB service received
2005.03.28	T-DMB carriers selected by KBC
2005.04.	Trial broadcasting started
2005.12.01	Broadcasting started (except Korea DMB)
2006.01.01	LGT, joined to distribute DMB Device
2006.01.02	KTF, joined to distribute DMB Device
2006.02	* Gap fillers scheduled to be installed on Subway Line 5-8
2006.03.01	Broadcasting service by Korea DMB scheduled
2006.03	SKT, expected to join in distribution of DMB Device
2006.06	Gap fillers scheduled to be installed on Subway Line 1-4
2007	Interactive Data Service expected to be provided

Source: ROA Group, Seri.org DMB Forum

(Table 2) Channel Operation by T-DMB Broadcaster

Broadcasters		Channel composition plan		Operation method	Characteristics	
		Channel name	Type of broadcasting			
Terrestrial TV broadcasters	Korea Broadcasting System (KBS)	KBS-Mobile 1	TV	Direct use	Composite channel	
		KBS-Mobile 3	Radio	Direct use	Music	
		KMMB-R	Radio	Lease (KMMB)	Life & Economy	
		OZIC	Radio	Lease (CJ Media)	Music	
	Munhwa Broadcasting Company (MBC)	KBS-Mobile 5	Data	Direct use	Composite channel	
		MBC DMB TV	TV	Direct use	Composite channel	
		MBC DMB Radio	Radio	Direct use	Composite channel	
		MBN Economy Radio	Radio	Lease (MBN)	Economy	
		Arirang English Radio	Radio	Lease(Arirang TV)	Korean culture	
	SBS	MBC DMB Data	Data	Direct use	Composite channel	
		SBS DMB TV	TV	Direct use	Composite channel(Interlocked Data broadcasting possible)	
		SBS DMB Radio	Radio	Direct use	Composite channel (Visual Radio broadcasting possible)	
		TBS (Traffic Broadcasting System)	Radio	Lease (TBS-Seoul city)	Traffic information	
		KFM (Gyeonggi Broadcast)	Radio	Lease (Gyeonggi Broadcast)	Local culture & art information	
		Hankyoreh DMB Data	Data	Lease (Hankyoreh Daily)	Current affairs information like job & education, Infoentertainment	
		LGT DMB Data	Data	Lease (LGTelecom)	Leisure & entertainment(Two-way data broadcasting)	
	Non-terrestrial TV broadcasters	YTN	SBS DMB Data	Data	Direct use	Development and experiment of new technology and new service (Composite channel)
			mYTN	TV	Direct use	News & information
			on TBN	Radio	Lease (Road Traffic Safety Authority)	Traffic information
			Latest song Satio	Radio	Lease (Satio)	Music
		1to1	NBEEN	Data	Direct use	Composite channel(Information-oriented data) portal)
1to1- TV			TV	Direct use	Composite channel	
i4U			Radio	Lease (Christian Broadcasting System)	Life & culture	
Live4U			Radio	Lease(Music City Media)	Performance music & culture	
U1 Media		1to1- Data	Data	Direct use	Composite channel	
		U1 Media	TV	Direct use	Composite channel	
	KBS Mobile 2	TV	Lease (KBS)	Family and culture		
		U1 Media data	Data	Direct use	Composite channel	

Source: ROA Group, DMB website for each company

2.2.2 Supply and demand strategy of contents and its directions of S-DMB operators

there is only one operator of S-DMB, TU Media. Currently, there are 11 video channels and 26 audio channels and its details and characteristics are well summarized in the following table.

Unlike T-DMB service provided by 6 carriers,

(Table 3) Satellite DMB Channel Composition of TU Media

Channel type	Channel	Name	Contents	
Video	CH05	Education (EBS)	Various education programs of EBS	
	CH06	SBS drama	Drama and entertainment program of SBS	
	CH07	Ch.BLUE	DMB program produced by TU Media	
	CH08	Music	Various music programs and music videos	
	CH11	MBC drama	Drama and entertainment program of MBC	
	CH12	News	News channel	
	CH13	Movie	Movie information and movies	
	CH14	Sports	Sports channel	
	CH16	Information on economy	News and various information on economy	
	CH17	Game	Various information on game and game program	
	CH19	Animation	Animation channel	
Audio	DJZone	CH31	STAR DJ	Music channel with DJs
		CH32	DEBUT CLUB	
		CH33	MANIA CLUB	
		CH34	CLUB 3040	
		CH35	MOBI CLUB	
	Variety Zone	CH41	Comedy	Various channels including foreign language and entertainment information
		CH42	English & Chinese conversation	
		CH43	English Channel	
		CH44	Audio book	
		CH45	Star & Sports	
	Nonstop Zone	CH51	Music preview	Non-stop music channel for 24 hours
		CH52	Latest pop song	
		CH53	Pop song 2000	
		CH54	Pop song 90	
		CH55	Pop song 7080	
		CH56	Old song	
CH57		Hit pop song		
CH58		J-POP		
CH59		Balad		
CH60		Dance		
CH61		Jazz		
CH62	Hiphop/R&B			
CH63	ROCK			
CH64	Classic			
CH65	New age			
CH66	Hit chart			

Type		Lineup/Contents	Program Plan
Video (Max 14 channels)	Per Genre (10)	News, soap operas, music, sports, education, game, movies, etc.	PP Lease (Modification to mobile environments)
	Mobile Specific Programs -Ch. BLUE- (1)	- Allocate programs specific for mobile environments (Short movies, animation, mobile soap operas, etc.) - Shorter content compared to conventional contents - Used for emergency	In-House
	Terrestrial TV (2)	Simultaneous retransmission of major terrestrial TV	TDB
Audio (Max 28 channels)	Basic Music (16)	Latest Hits, Oldies, Theme 24 hours Music	PP Lease
	DJ Music (7)	Star DJ, Amateur DJ, Mania, Live Music, etc. DJ's Choice	
	Variety (3)	Education, entertainment, audio book, news etc.	
Data	Information (TBD)	Data broadcasting related with video & audio channels and information data broadcasting	In-House and DP Lease

(Figure 2) Strategy of S-DMB Channel Composition of TU Media

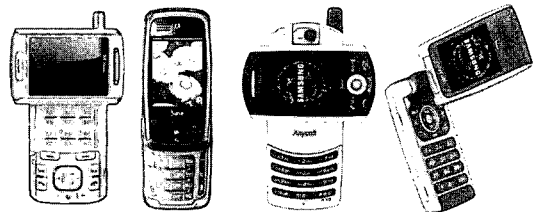
3. Development Status and Outlook of Device

Since the commercial launch of Satellite DMB (May 2005) and Terrestrial DMB (December 2005), a wide array of DMB devices have been released until now.

3.1 Mobile Phone-type Device

Mobile phone-type device, mostly preferred by users have mobile phone and camera features and a horizontal screen allowing users to benefit from easier viewing of DMB services.

LG SB-130 Curitel PT-S160 Samsung SCH-B300 Samsung SCH-B330



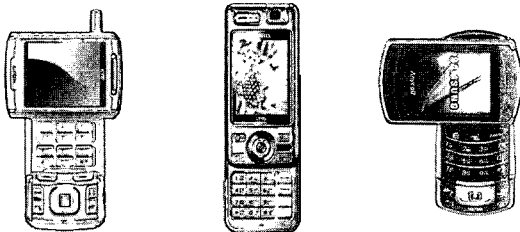
Source: www.cyon.co.kr, www.curitel.com, www.anycall.com\

(Figure 4) Recently Released Mobile Phone-type S-DMB Devices

3.2 PDA-type Device

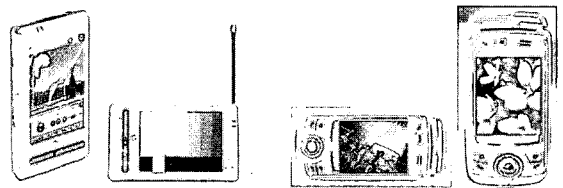
Function to receive mobile broadcasting service is installed on PDA or Smart Phone with touch screen.

LG KD-1200 Curitel PT-K1800 Samsung SPH-B2300



(Figure 3) Recently Released Mobile Phone-type T-DMB Devices

LG PM80 POZ B300



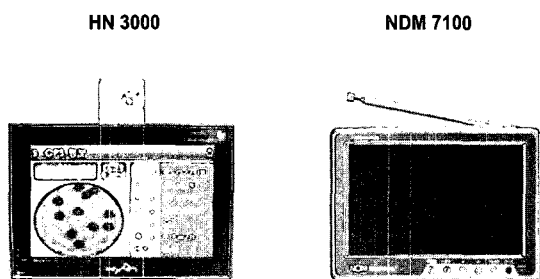
Source: www.lge.co.kr, www.cb.co.kr

(Figure 5) PDA-type T-DMB (left side) & S-DMB(right side) Devices

3.3 In-Car Device

In-Car device falls into three categories as follows.

1. Separable device with a setup box-type receiver connected to an in-car TV
2. Device combining monitor and a setup box
3. Device with navigator functions

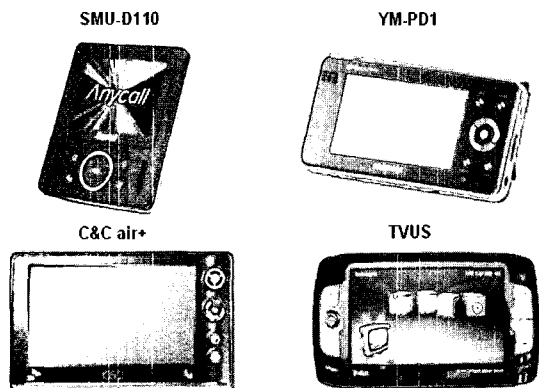


(Figure 6) In-Car S-DMB(left side) & T-DMB (right side) Devices

Source : www.hyondcorp.com, www.gtek.co.kr

3.4 PMP-type Device

A variety of multimedia entertainments are provided through one device.

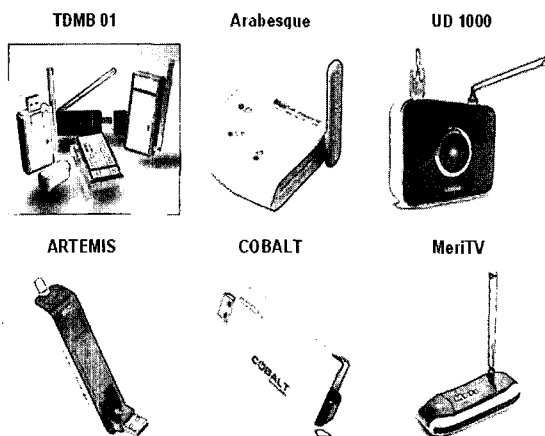


(Figure 7) PMP-type S-DMB(left side) & T-DMB (right side) Devices

Source: www.sec.co.kr, www.skcnctv.com, www.homecast.net

3.5 USB-type Device

To receive DMB service is possible by connecting USB-type DMB device to desktop PC or laptop PC.

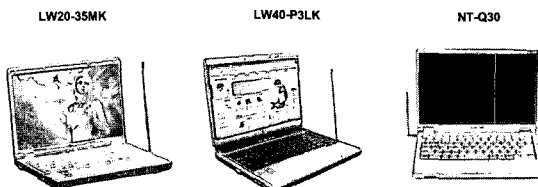


(Figure 8) USB-type T-DMB Devices

Source: www.htel.co.kr, www.enwiser.com, www.mnbt.co.kr, www.ubibro.com, www.cobalt-tech.co.kr, www.meritech.co.kr

3.6 Laptop PC-type Device

By installing DMB receiver or PC card for broadcasting, it is possible to watch DMB service on laptop PC.

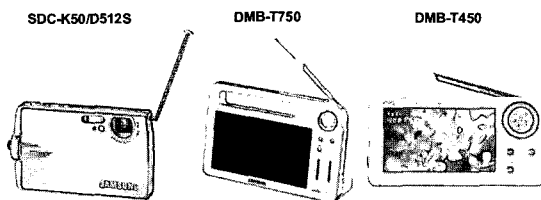


(Figure 9) Laptop PC-type T-DMB Devices

Source: www.sec.co.kr, www.lge.co.kr

3.6 Others

The function to receive DMB service is installed in DMB camera or digital camera.



(Figure 10) Other T-DMB Devices

Source: www.sec.co.kr

4. Conclusion

4.1 Market Size Projection

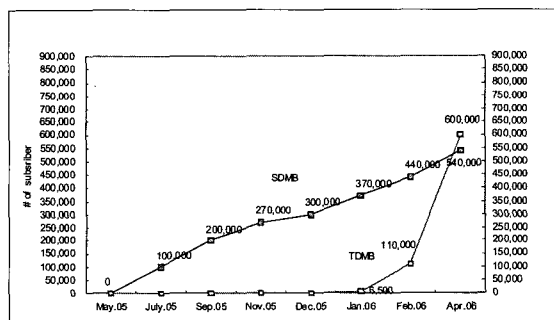
Based on the current number of DMB subscribers, ROA Group estimates that the DMB market of Korea will grow to the amount of 136.9 billion KRW in 2006.

(Table 4) Projection of Korean DMB Market Size, Unit: Billion KRW

Classification	2006	2007	2008	2009	2010
DMB	1,368	2,794	6,320	9,125	13,557

Source: ROA Group

As of the end of April 2006, the number of S-DMB subscribers amounts to 544,000 while that of T-DMB 600,000.



(Figure 11) DMB Subscribers in Korea, Unit: persons

Source:ROA Group

4.2 Keys to the Success of DMB Service

Prospects for DMB service in Korea are related to operators' strategy of contents supply and demand mentioned in the chapter 3. In other words, T-DMB service carriers provide service containing common attributes of T-DMB and unique contents reflecting the characteristics of each carrier. But, services can be overlapped because several operators offer services at the same time.

Meanwhile, as for S-DMB service, it is easier to maintain consistency because one broadcaster runs various channels. However, it is inevitable that S-DMB operator is not capable of providing unique contents.

Under these circumstances, future course of directions of both DMB services depend on success factors of the service.

First, DMB service is required to devise a strategy bringing out mobility because DMB is targeting those who are on the go constantly. Business environment for DMB is worse than that of terrestrial TV, satellite TV and Cable broadcasting in watching environment and device. Therefore, DMB's killer service would be the one focusing on differentiating with other services and building competitiveness by providing mobility-oriented service.

Second, it is important to increase competitiveness in radio and data broadcasting. As mentioned above, video broadcasting is less competitive than terrestrial broadcasting. However, radio and data broadcasting have enough competitiveness in service quality, watching environment and device compared to land-based broadcasting. Plus, by combining video broadcasting with radio and data broadcasting, DMB providers can build competitiveness.

Third, it is also important to strengthen competitiveness by taking advantage of Interactive Service, which is expected to play a pivotal role in promoting DMB service. Interactive Service will enhance the quality of service through monitoring responses of users and allow users to participate in broadcasting that goes beyond the one-way broadcasting. Furthermore, with T-Commerce started through Interactive Service,

it can lay the groundwork for the creation of various profit models.

Not only the above three success factors but also a variety of determining factors can influence DMB service to be successfully developed. This service is only in its initial stage of development and has the potential to be further developed along with various technologies.

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