

IP-TV Service Business Opportunity and Prospects

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<요 약>

초고속인터넷은 지상파방송, 케이블 TV, 위성방송에 이어 또 다른 미디어로 부각되기 시작 하였다. 특히 통신과 방송이 융화되는 환경 하에서 IP-TV 서비스는 통신사업자나 방송사업자에게 매우 중요한 중심 매체로 등장 되었고, 접속기술, 네트워크 기술, 동영상 압축기술 등 기술의 발전은 더 이상 기술적인 요인이 IP-TV 서비스 활성화의 장애 요인으로 작용하지 않게 되었고, 서비스를 위한 장비 및 단말가격의 급격한 가격하락은 사업의 성공 가능성을 더 높여 주게 되었다.

IP-TV 서비스는 보다 양질의 멀티미디어 서비스를 원하는 고객의 수요와 신규 고객을 유치하고 가입자를 Lock-in 시키며, 타 통신 사업자의 고객을 자사 고객으로 전환시키고자 하는 차별화 전략의 일환으로 통신사업자들이 적극적으로 도입하고 있다. 특히 망 진화에 따른 차세대 초고속인터넷 서비스 기술인 VDSL이나 Advanced 케이블모뎀을 이용 DVD 급 고화질의 IP-TV 서비스가 시작되면서 ARPU를 증대 시키고 다양한 수익원 개발의 일환으로 인터넷 접속서비스 외에 부가가치를 창출 할 수 있는 Killer Service로서 주목을 받고 있다. IP-TV 서비스는 가입자망의 진화 와 밀접하게 연관되어 전개되는 서비스로 Post-ADSL에 대한 예측과 IP-TV 서비스에 대한 설문조사 결과를 토대로 하여 예측 한 바에 의하면

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Post-ADSL 가입자는 2005년 300만 명에서 2006년 480만으로 증가하고 2009년 1,024만 명에 이를 것으로 전망되고, IP-TV 서비스 가입자도 2005년 36만 명에서 2006년 88만으로 증가하고 2009년 382만 명으로 증가하는 것으로 예측되었다.

Key Word: IP-TV Service, Customer Acceptance, Business Opportunity, Post-ADSL, Subscriber Forecast.

I . Introduction

The single most remarkable phenomenon taking place in today's information and communications market is the accelerating convergence between telecom and broadcasting. The progress of information and communications technology is fast making digital multimedia content and digitalized, broadband networks a market standard. The convergence of communications and broadcasting, enabling service providers to go beyond the traditional boundaries of their respective sectors and offer value-added services, is beneficial for both industries. Through convergence, telecom operators can supply high-value-added, quality multimedia content, while broadcasters can offer communications services using their broadcasting networks, and two-way services; a dramatic improvement over the traditional one-way mode of broadcasting. Yet, communications and broadcasting convergence, as the process gains momentum, is not just perceived as an opportunity, but also as a threat, especially by telecom operators. Over the short term, the benefit of convergence for telecom operators will be that they will see their market expanded, as they will be able to capture part of the broadcasting market. But, this benefit comes at the cost of introducing a new competitor into the telecom market, in the form of broadcasters. Meanwhile, convergence between the two industries and technologies yields an undeniable long-term benefit. The two-way flow of information, a quint essential characteristic of information technology, is bound to broaden the territory for ICT industries in dramatically new ways.

Moreover, the telecom market is badly in need of new business models. The broadband internet market has now entered the maturity stage, and the growth is sharply slowing down, while competition is becoming ever more intense. Telcos are therefore faced with the need to find new sources of revenue. They must move away from a marketing strategy targeting potential demand in broadband internet connection alone, and attract new subscribers by offering new value-added services and differentiated services, increasing ARPU (Average Revenue per Unit). This paper is generally concerned with the convergence between communications and broadcasting from the perspective of telcos, in other words, communications service providers venturing into the broadcasting market. It is more particularly concerned with IP-TV (Internet Protocol Television) provided through a non-mobile, wired platform, and will provide a market forecast for this service. IP-TV is a service transmitting broadcast programs through broadband internet networks. From the public's point of view, IP-TV does not essentially differ from cable TV. However, the service launch has thus far been delayed due to the uncertainty surrounding its legal status. The question whether it is a broadcasting or communications service is still under debate.

The technological environment is fast nearing readiness for the convergence between communications and broadcasting, as digital technology has reached a sufficient level to guarantee reliable quality for convergence services, and most networks are broadband and are being upgraded. The progress in the policy environment, on the other hand, has been slower. Debates over regulatory and institutional reforms necessary for convergence services, and the creation of a consolidated, single controlling authority over these services have only just begun. Compared to the US, UK and other advanced industrialized nations, the policy environment in Korea is at best inadequate. The conflict of interest between government agencies has been detrimental to the decision-making process among policy makers.

In spite of the less than ripe policy environment, Korea's telcos and broadcasters are seen in recent months busily positioning themselves to stake their territory in the future convergence service market. To sum up, telcos are heavily investing in platforms like satellite broadcasting and DMB, and broadcasters are reacting to such moves by telcos with

apprehension. Meanwhile, CATV operators are also foraying into the broadband internet market, previously the exclusive domain of telcos. Despite these industry-transforming business initiatives, little progress has been seen in borderline-type services such as internet broadcasting and VOD, still remaining modest in market size.

Of the numerous types of broadcasting-telecom convergence services currently offered or scheduled to be launched, two most representative services are DMB (Digital Multimedia Broadcasting) for wireless platform and IP-TV(Internet Protocol Television) for wired platform. IP-TV is a TV service provided through xDSL or broadband cable subscriber networks¹⁾. This internet-based TV service, known as IP-TV in the US, is referred to as ADSL TV in Europe, and broadband broadcasting in Japan. While no agreement yet exists at the level of nomenclature, pilot IP-TV services were begun worldwide from 2002 and onward. Commercial rollout started in 2003²⁾. Initially, the service was introduced as a VOD (video on demand) service by big telcos. More recently, however, IP-TV emerged as an important medium valued as an independent business model with a proven market potential, especially in Europe and Asia. With the progress seen in internet connection and network technologies and video compression technology, the IP-TV market is expected to undergo a sharp growth. 109 million of the total worldwide DSL subscribers (forecast based on 2004 data) are projected to constitute the potential customer base for IP-TV services³⁾.

Also in Korea, broadcasting-telecom convergence services of the type similar to IP-TV, provided through its vast broadband internet infrastructure, are viewed as new revenue sources. IP-TV service can attract new customers desiring quality multimedia services as well as lock in existing customers and win over customers of competitors. IP-TV was introduced as part of a strategy to diversify service portfolios and drive up ARPU, and is now regarded as a killer service, which, offered as an extra service in addition to internet access service, can generate value added. Furthermore, adding the two-way mode of communication to the

1) MRG(2004)

2) In Korea, the service is sometimes referred to as iCOD(internet Content on Demand).

3) MRG(2005)

traditional non-interactive broadcasting model, IP-TV offers a broader set of choices to consumers. Consumers can view a program when they wish, and look up information relating to props, costumes or locations and shooting sites and even purchase some of these products that are offered for sale. The service can be flexibly custom-tailored to suit individual consumer needs, maximizing consumer utility. IP-TV can moreover be bundled with a wide variety of other value-added services such as VOD, video conference, T-Commerce and e-Learning to meet individual needs.

The rest of this paper is organized into two main different sections. Section II focuses on the customer perception of IP-TV service, as shown in the results of two surveys conducted before and after a pilot program, to assess the business opportunity presented by this new service. Section III will provide a forecast on market potential of this service by sizing the number of potential subscribers, also based on the same survey results.

II. Customer Acceptance of IP-TV Service

IP-TV presents several advantages for consumers over traditional broadcasting, such as the possibility to search for information and content, two-way services like games, and the ability to view programs at times of their choice. Another strengths of IP-TV resides in the fact that consumers can receive this innovative new service using the TV sets they already have at home. No less important is the convenience of all-in-one billing. Consumers no longer have to deal with the hassle of receiving separate bills from different providers on telephone, broadband internet service and cable TV. IP-TV being a service package including all these, consumers can pay one bill for all their communications and TV related services, and even receive one-stop services. Undoubtedly convenient, IP-TV nevertheless needs to be priced right and maintain superior service quality in order to create a successful perception as a new service. Like all new technologies and services, consumers' willingness-to-pay remains a matter of prime importance. Accordingly, for the purposes of this study, we conducted two surveys on consumers, before and after they were exposed to

IP-TV through a pilot program. The primary objective of these surveys was to observe changes in level of recognition of IP-TV among consumers, perceived need, intention to subscribe and level of satisfaction once they tried the service.

〈Table 1〉 Questionnaire Items in Before and After-Pilot Service Consumer Surveys

		Pre-pilot Service Survey	Post-pilot Service Survey
IP-TV Service		Level of recognition Perceived need Subscription intention	Perceived need Subscription intention
Individual Service Components	VOD	Level of recognition Perceived need Subscription intention Usage (projected) Types of content	Perceived need Subscription intention Level of satisfaction Usage (actual) Types of content
	Broadcast Network Channels	Level of recognition Perceived need Content	Perceived need Level of satisfaction Subscription intention Content
	SMS	Level of recognition Perceived need Subscription intention	Level of recognition Perceived need Subscription intention
	Information Service	Level of recognition Perceived need	Perceived need Level of satisfaction

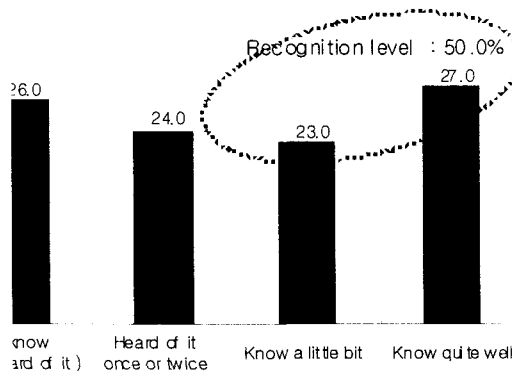
These consumer acceptance surveys were conducted on participants of a pilot IP-TV program, which lasted between March 25 and April 30, 2004, offered to 100 households that were company employee families, and 100 other general households. The survey results were used in this study to analyze customer needs in IP-TV. Four different services were provided during the pilot period; (1) VOD: instantly delivery of requested video content including films with high definition image and high-quality audio, TV dramas and educational content (2) broadcast network channel service: broadcast programs re-transmitted using IP multicasting technology; (3) SMS: Text messages sent from TV to mobile phones, and (4) information service: for looking up businesses and public service information.

As shown in 〈Table 1〉 above, two consumer acceptance surveys were conducted, before

and after the pilot service. Both surveys asked questions regarding the overall IP-TV service and those regarding individual services making up the service package. Concerning individual service components, the question relating to consumer recognition was asked in the survey prior to the pilot service, that on the level of customer satisfaction, only in the survey after the pilot service. Questions on perceived need, intention to subscribe, usage pattern and content were asked in both surveys.

1. Results of Pre-Pilot Service Survey

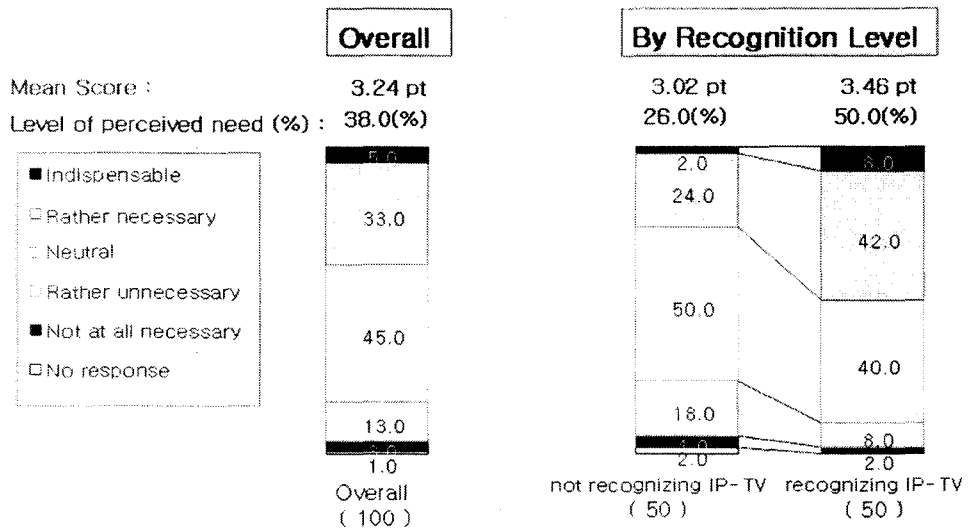
As illustrated in <Figure 1> below, 74% of the consumers surveyed have heard about IP-TV service at least once, while 50% of them answered that they knew a little bit or a lot about the service.



<Figure 1> Consumer Recognition of IP-TV Service

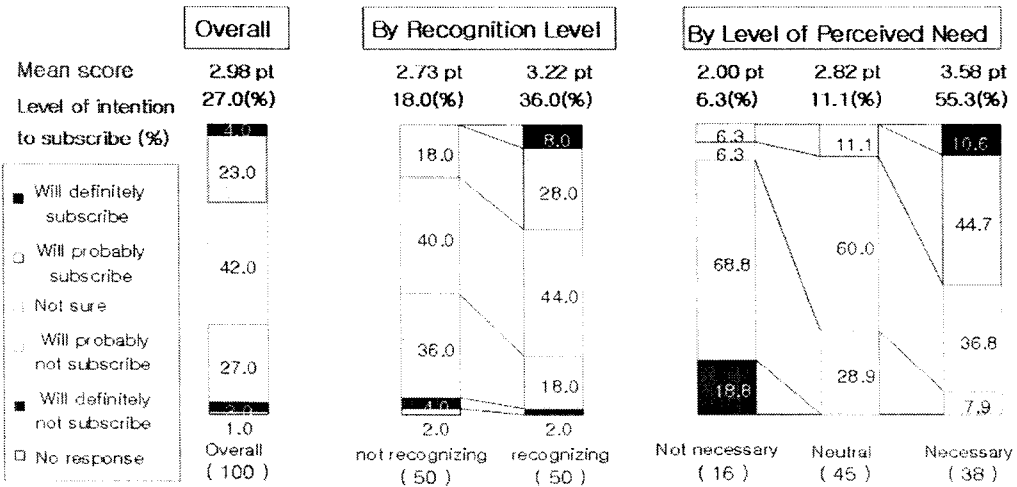
Answers of the respondents to questions on perceived need for IP-TV service and subscription intention are given in <Figure 2> below. 38% of them answered the service is necessary, which corresponds to 3.24 points on a 5 point scale. When comparing respondents who recognized the service and those who did not, a majority (50%) of those who answered that they knew a little or quite well about IP-TV service chose the answer

“Rather necessary” or “Indispensable.” The result therefore suggests the need for a marketing strategy which can improve consumer recognition of IP-TV service.



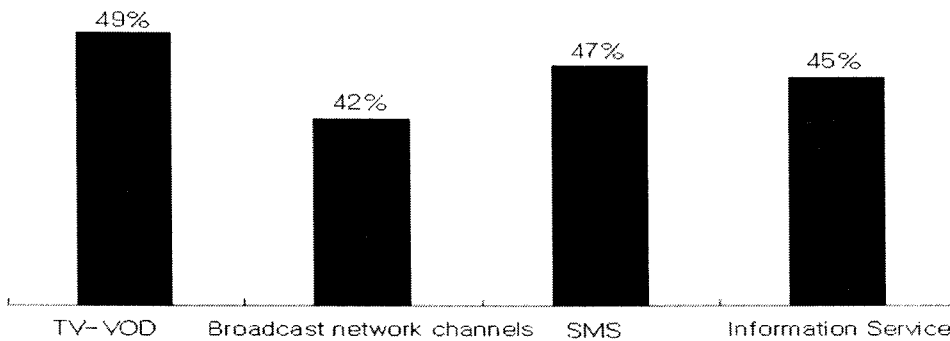
〈Figure 2〉 Perceived Need for IP-TV Service (Pre-pilot service survey)

Meanwhile, as shown in 〈Figure 3〉 below, 27% of respondents expressed an intention to subscribe to an IP-TV service, which translates into 2,98 points on a 5 point scale. By recognition level, those who expressed the intention to subscribe to an IP-TV service among respondents who recognized or knew of it were twice as numerous as among those who did not recognized or knew of it. A majority (55.3%) of those respondents who answered that IP-TV service is necessary expressed an intention to subscribe to it.



〈Figure 3〉 Intention to Subscribe to IP-TV Service (Pre-pilot service survey)

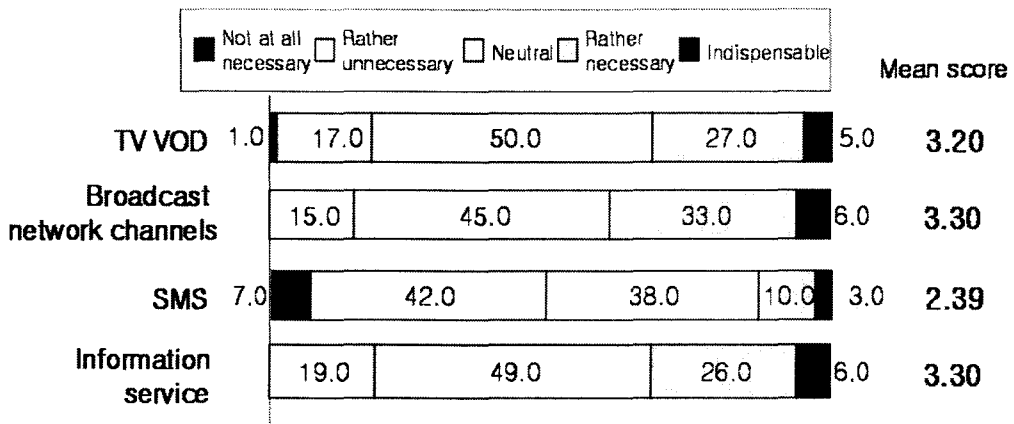
With regard to individual IP-TV service components, the level of consumer recognition, as provided in [Figure 4] below, proved to be the highest with TV-VOD, and was at its lowest (42%) with SMS service (many respondents answered they have never heard of it).



〈Figure 4〉 Consumer Recognition of Individual IP-TV Service Components (Pre-pilot service survey)

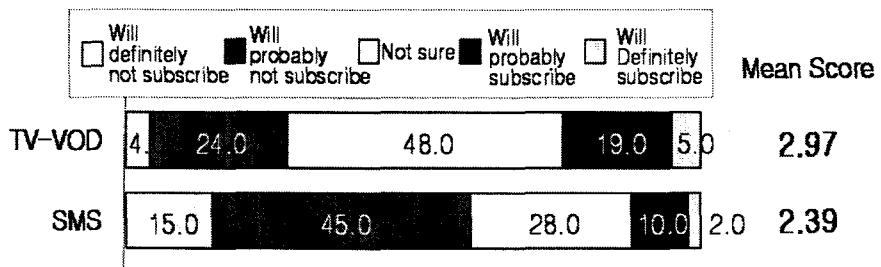
〈Figure 5〉 gives the levels of perceived need with regard to individual IP-TV service components. TV-VOD service was considered necessary by 32% of total respondents,

broadcast network channels by 39%, and information service by 32%. The level of perceived need was at the lowest with SMS service, with only 13% of respondents considering it necessary or indispensable.



(Figure 5) Perceived Need for Individual IP-TV Services (Pre-pilot service survey)

Meanwhile, as indicated by (Figure 6) below, 24% of respondents expressed an intention to subscribe to a TV-VOD service, while only 12% of them declared an intention to subscribe to a SMS.

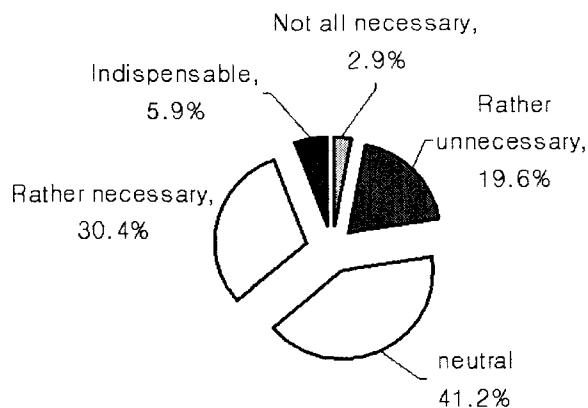


(Figure 6) Intention to Subscribe by Individual IP-TV Service Component (Pre-pilot service survey)

Among popular reasons for subscribing to a TV-VOD service were (1) the freedom to choose content and viewing time, (2) expectation of more affordable pricing than video rental rates, and (3) expectation of being able to view latest releases, in this order. Meanwhile, reasons chosen by respondents for not subscribing to a TV-VOD service included (1) the possibility of viewing similar content through broadcast network or internet services free of charge or at low cost; and (2) lack of time for viewing video content.

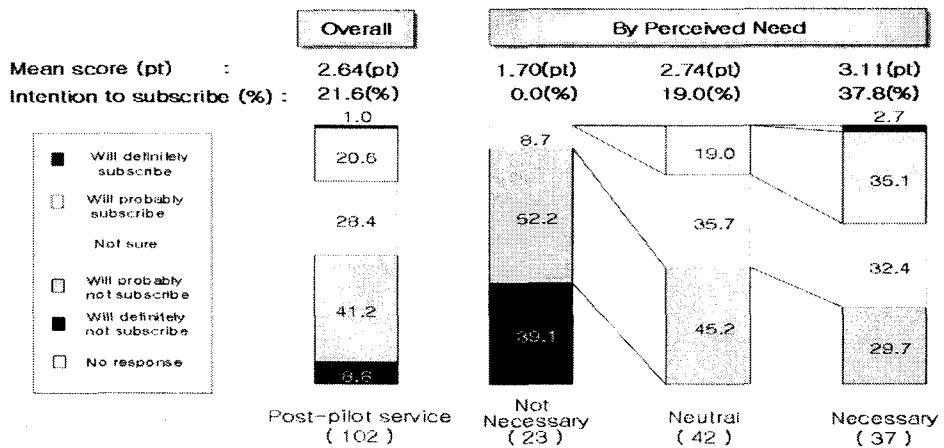
2. Results of Post-Pilot Service Survey

After participating in the pilot IP-TV program, as indicated by <Figure 7>, 36.3% of total respondents considered the service necessary, with 5.9% selecting 'indispensable' and 30.4% selection 'rather necessary.' This level of perceived need is somewhat lower than 38% surveyed prior to the pilot service. The statistical significance of this size of variation in survey response is rather negligible. Nevertheless, it points toward the fact that, unless it is appealing enough to consumers to be perceived as an indispensable service, IP-TV service runs the risk of getting rejected by consumers.



<Figure 7> Perceived Need for IP-TV Service (Post-pilot Service Survey)

As shown in (Figure 8) below, 21.6% of respondents, having participated in the pilot program, indicated an intention to subscribe to an IP-TV service, which translates into a mean score of 2.64 points on a 5-point scale⁴⁾.

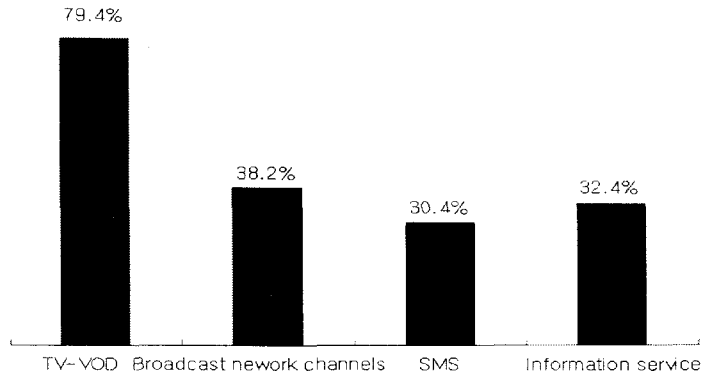


(Figure 8) Intention to Subscribe to IP-TV Service (Post-pilot Service Survey)

Those who expressed an intention to subscribe to an IP-TV service (1) appreciated the diversity of the service package; (2) found a desired service in the package; and (3) valued the convenience. Popular reasons for not subscribing to an IP-TV service were (1) high service fee; (2) lack of need; and (3) costliness of equipment.

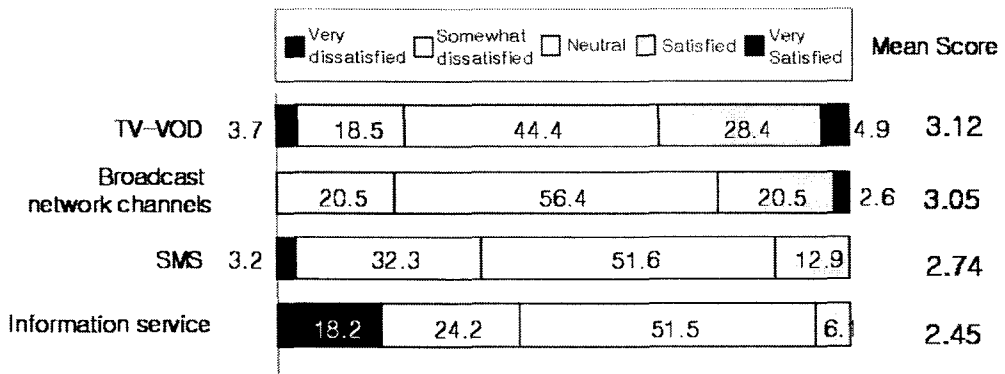
Regarding usage of individual IP-TV service components, as indicated in (Figure 9), TV-VOD was the most used service (79.4%), followed by broadcast network channels, information service, and SMS; all three in the mere 30% range.

4) A gateway fee of 350,000 won and monthly service charge of 16,000 - 25,000 won were proposed.



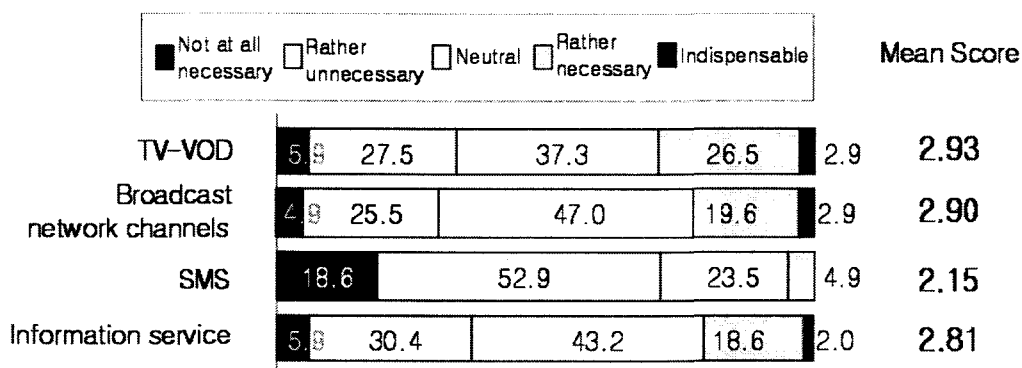
〈Figure 9〉 IP-TV Usage by Individual Service Component

The levels of customer satisfaction for each of the individual IP-TV service components are provided in [Figure 10] below. Satisfaction level for TV-VOD service was at 33.3%, and for broadcast network channel service, 23.1%. The level of satisfaction was quite low for SMS and information service, standing at 12.9% and 6.1%, respectively. With regard to areas of improvement, respondents chose ‘the size of content selection’ for TV-VOD and broadcast channels, ‘ease of text input’ for SMS, and ‘size of information database’ for information service.



〈Figure 10〉 Satisfaction with Individual IP-TV Service Components

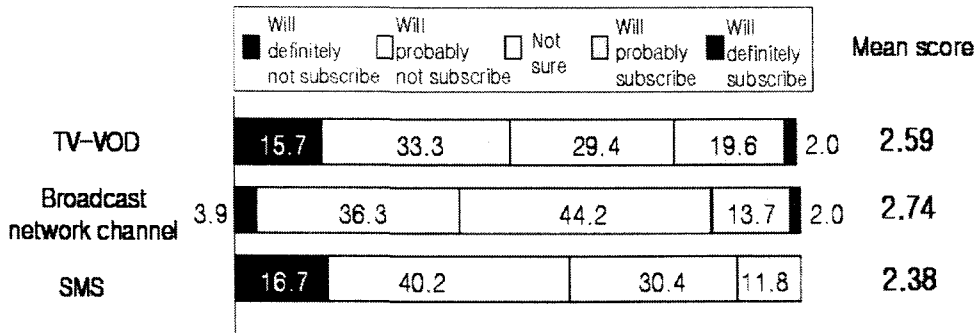
Concerning perceived need and intention to subscribe with regard to individual IP-TV service components, as shown in (Figure 11) below, satisfaction level for TV-VOD was at 29.4%, for broadcast channel service, 22.5%, and information service, 20.6%. The level of perceived need for SMS was surveyed extremely low, amounting to 4.9%.



(Figure 11) Perceived Need by Individual IP-TV Service Component (Post-pilot service survey)

(Figure 12) gives consumer intention to subscribe to individual service components, as expressed by survey respondents after the pilot program, 21.6% of them indicated an intention to subscribe to a TV-VOD service, 15.7% to a broadcast network channel transmission service, and 11.8% to a SMS⁵⁾. On a 5 point scale, broadcast channel transmission scored higher than TV-VOD by earning 2.74points. A large number of those who expressed an intention to subscribe to a broadcast channel transmission service indicated a moderate level of commitment by selecting the answer "Will probably subscribe."

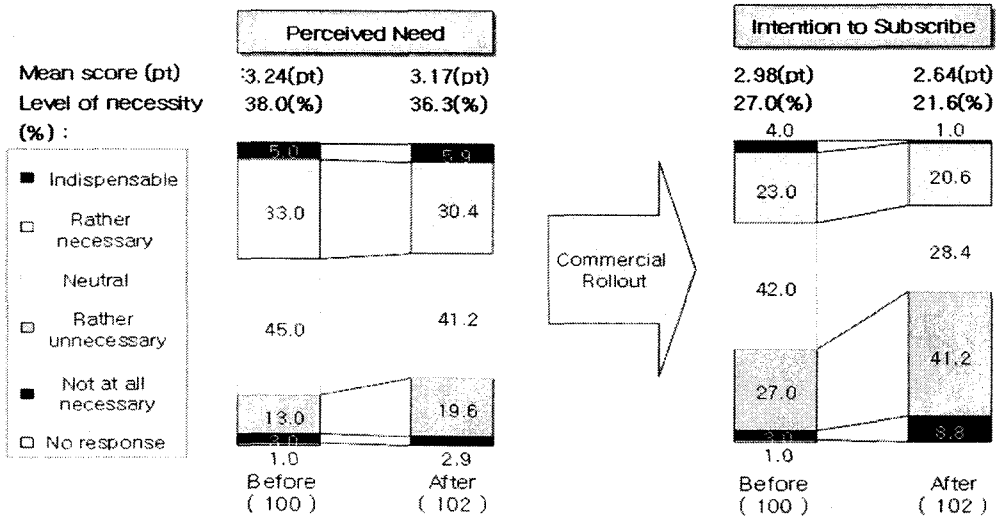
5) The proposed rate for SMS was 20 won per message.



〈Figure12〉 Intention to Subscribe by Individual IP-TV Service Component (Post-pilot service survey)

3. Comparison of Pre-pilot Service and Post-pilot Service Survey Results

As illustrated by 〈Figure 13〉 below, the level of consumer acceptance of IP-TV service remains virtually unchanged after the pilot program. However, the results of the pre-pilot service and the post-pilot service surveys may be assigned different significances, insofar as, while no specific prices were suggested during the first survey, during the second one, respondents were proposed a gateway fee of 350,000 won, and a monthly service charge of 16,000 - 25,000 won. A global assessment of the results of the two surveys would therefore indicate that most respondents feel the need for IP-TV or a new service of a similar type, and are willing to subscribe to one. On the other hand, the level of willingness-to-pay for the additional expenditure, incurred from adopting a new service, appeared rather low.



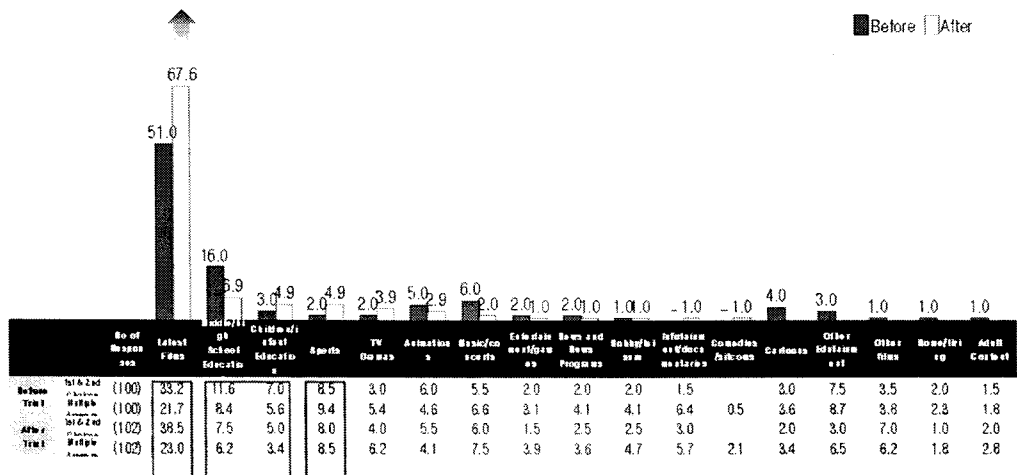
[Figure13] Change in Consumer Acceptance of IP-TV Service (pre-pilot service and post-pilot service surveys)

〈Table 2〉 provides the level of consumer acceptance with regard to individual components of an IP-TV service. Perceived levels of need relating to individual service components were generally on a decline compared to the survey conducted before the pilot service. However, that with regard to IP-TV service as a whole remained almost unchanged. This is an indication that the service as a package of several services appreciates synergy. Meanwhile, fewer respondents expressed an intention to subscribe with regard both to an IP-TV service as a whole and individual components of it than at the initial survey. The level of intention to subscribe to a TV-VOD service sharply decreased from the pre-pilot service survey, with the most popular reasons not to subscribe being cost (40%) and insufficiency of content selection (24%). Among the reasons cited for not subscribing to a broadcast network channel transmission service, were the similarity of the content to that provided through terrestrial and cable TV, and the limited size of content selection. These results suggest that IP-TV service providers need to draw up marketing strategies enabling them to compete viably with existing services of similar types, for instance, by providing content with high definition image and high sound quality at low prices.

<Table 2> Change in Consumer Acceptance by Individual IP-TV Service Component

		Perceived Need		Intention to Subscribe ⁶⁾	
		Before	After	Before	After
IP-TV Service		3.24	3.17	2.98	2.64
Individual Service Components	TV-VOD	3.18	2.93	2.97	2.59
	Broadcast network Channels	3.30	2.90	-	2.73
	SMS	2.60	2.14	2.39	2.38
	Information service	3.19	2.80	-	-

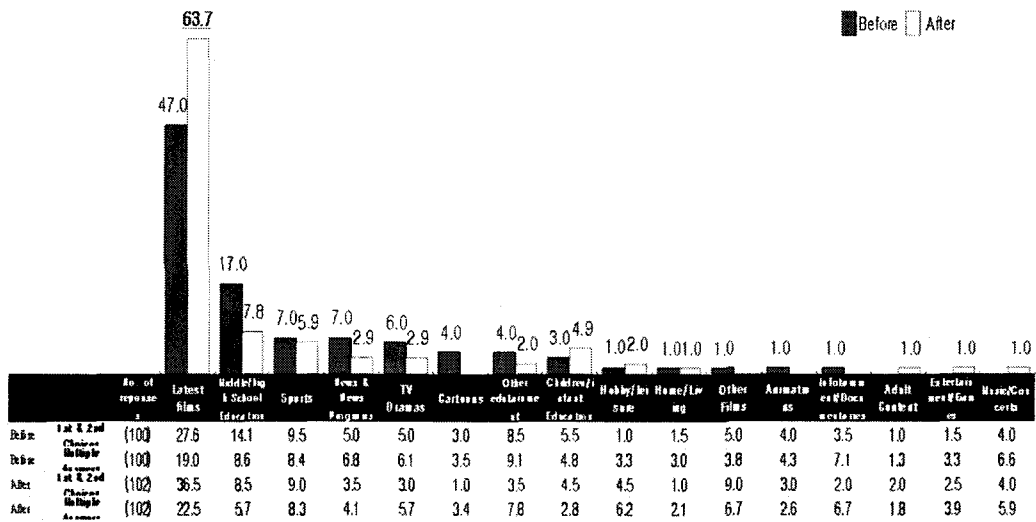
Types of TV-VOD content desired by respondents are shown in <Figure 14>. Prior to the pilot service, the latest films ranked the highest (51%), followed by educational content geared toward middle and high school students (16%) and music/concerts(6%). After having participated in the pilot program, the preference for the latest films surged sharply (67.6%). The second-most preferred type of TV-VOD content was educational content for middle and high school students (6.9%), followed by educational content for children/infants (4.9%) and sports (2%).



<Figure 14> Desired Types of Content for TV-VOD Service

6) No subscription fee was proposed at the time of the pre-pilot service survey. The following pricing was proposed during the second survey after the pilot program: IP-TV service (gateway fee 350,000 won + monthly service charge 16,000 - 25,000 won), TV-VOD (no rates proposed), broadcast network channels (no rates) and SMS (20 won per message).

With regard to broadcast network channels, as indicated in [Figure 15] below, the most popular types of content before the pilot service were the latest films (47%), educational content for middle and high school students (17%) and sports (7%), in this order. After the pilot service, the preference for latest films became much stronger (63.7%) just as with TV-VOD content. 7.9% and 5.9% of respondents respectively chose educational content for middle and high school students and sports as their most preferred content.



(Figure 15) Desired Types of Content for Broadcast Network Channel Service

From TV-VOD to broadcast network channel service, the preference pattern remained very similar. For both services, latest films, educational content and sports were the most popular types of programs. In other types of content, the distribution of preference showed slight differences. A significantly larger number of respondents preferred animations and music/concerts as a TV-VOD content than as a broadcast network channel content, and news and TV drama as a broadcast channel content than as a TV-VOD content.

III. IP-TV Subscriber Forecast

1. Data and Methodology

Predicting the size of Korea's IP-TV market is an exercise marred by numerous uncertainties. Much depends on the government policy concerning IP-TV service, which remains to be clarified, the final outcome to the conflict between telcos regarding their respective territories, and the question whether and when IP-TV service providers can re-transmit broadcast network content, without which the content selection would be less than sufficient for the service roll-out. Furthermore, at a technological level, IP-TV service requires a minimum speed of 5Mbps. This means that existing ADSL or cable modem-based internet connection is far too slow, and needs to be replaced by VDSL, apartment complex-LAN or advanced cable modem connection.

Data used in this study include the broadband subscriber statistics released by the Ministry of Information and Communication⁷⁾ and technical documentations of individual ISPs relating to internet connection speed (VDSL speed and above required for transmission of high definition video content⁸⁾. In order to predict the number of subscribers to IP-TV service in Korea, in this paper, we estimated the number of subscribers to an internet service supporting a speed of 5Mbps and faster (post-ADSL subscribers⁹⁾). As for the data on intention to subscribe to an IP-TV service surveyed on respondents having participated in the pilot program, we calculated the migration probability by assigning a weight to each category of answers expressing an intention to subscribe, following the procedure used by

7) Ministry of Information and Communication, Monthly Internet Statistics.

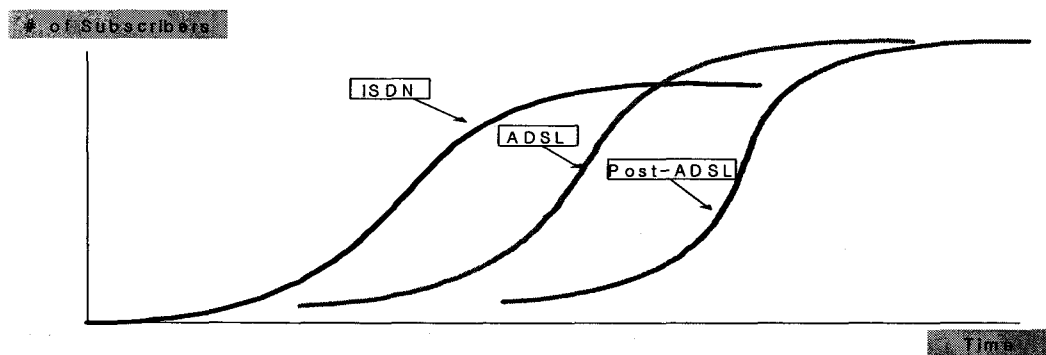
8) As of end of 2004, the number of subscribers to KT-provided broadband internet services of a VDSL or faster speed was 1.92 million (31.7% of total subscribers), and the corresponding figure for Hanaro Telecom stood at 260,000 (9.4% of total subscribers).

9) Among the services currently offered, those which exceed the ADSL speed range, therefore qualifying as post-ADSL services, include KT's Ntopia (VDSL, apartment complex LAN or Ethernet, 5Mbps - 20Mbps), Hanaro Telecom's Upgrade HFC (provided by upgrading trunks of Hanafos or HFC networks), and Thrunet on TV provided through Thrunet's CATV networks.

Urban and Hauser (1993) to avoid over-forecasting. Different weights were used for different years, taking into account the word-of-mouth effect and improvement in service quality.

2. Subscriber Forecast

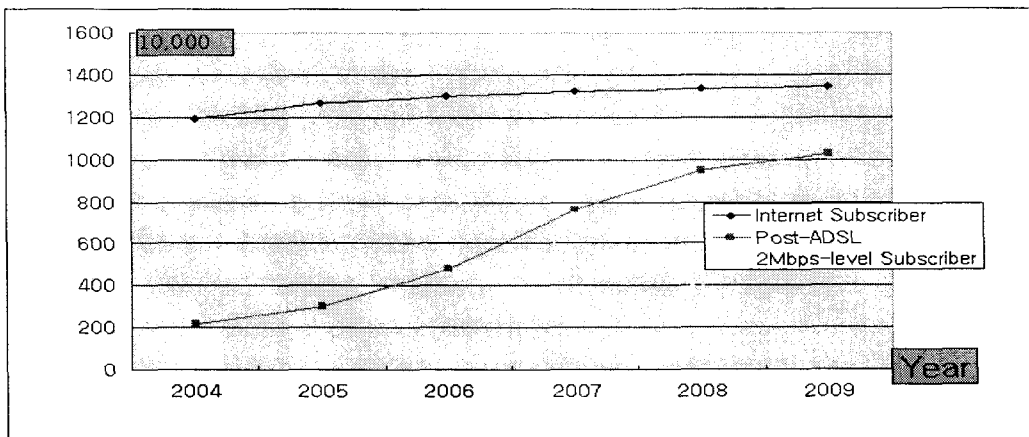
In order to predict future demand for IP-TV service, one must first formulate a forecast on the post-ADSL market. In other words, one needs to project the pattern of migration by the current pool of subscribers to HFC and ADSL services toward the next-generation broadband market (Post-ADSL). As shown in (Figure 16) below, Korea's broadband internet subscribers migrated in the past from ISDN to ADSL. Although the exact technology which will replace ADSL remains to be determined, the transition to a post-ADSL technology itself remains a quasi-certainty. However, no reliable forecast exist as of yet as to when such migration process will start, what scope this migration will be and how fast it will take place.



(Figure 16) Broadband Subscriber Migration in Korea

To estimate the number of subscribers to post-ADSL internet service, we used the Gompertz model or logistic model to predict the saturation point in the broadband market. Based on this estimate, the speed of diffusion of post-ADSL service and pattern of service migration were predicted, using a Bass model of substitution¹⁰. The results are given in

(Figure 17). The broadband market is projected to hit the saturation point in late 2004, when the total number of subscribers reaches 11.92 million. In other words, the increase in market demand from this point on will be only a measure of increase in population or in numbers of households. Even with the natural increase, the total number of subscribers is not expected to exceed 13 to 13.5 million. Meanwhile, switch-overs to faster post-ADSL services by subscribers are expected to take place at a rapid pace. Subscribers to post-ADSL services are projected to total 4.8 million in 2006 and 7.65 million in 2007, surpassing the number of subscribers to broadband services of a speed of 2Mbps or faster.



(Figure 17) Post-ADSL Subscriber Forecast

After estimating the number of post-ADSL internet subscribers, we then turned to the numbers of survey respondents who indicated a positive intention to subscribe to IP-TV service; that is to say, numbers of those who selected the answers “Not sure,” “Will probably subscribe” and “Will definitely subscribe,” respectively, and the percentages

10) Refer to Meade and Islam (1995) for details of the Gompertz model and logistic model, and to Byung-sun Cho (2002), Byung-sun Cho & Sang-sup Cho (2003), and Byung-sun Cho & Ho-young Hwang (2004), for details of the methodology for predicting the number of subscribers to post-ADSL internet service using the Bass model of substitution.

accounted for by each of the three groups. To avoid over-forecasting, weights were assigned to the numbers of respondents expressing an intention to subscribe to an IP-TV service following the method proposed by Urban and Hauser (1993). Weighted probability of subscription was calculated by assigning 10% for the probability of migration among those who selected the answer "Not sure," 40% for those who answered "Will probably subscribe," and 90% for those who answered "Will definitely subscribe." Assuming that the improvement in service quality and word-of-mouth advertising help drive up the level of intention to subscribe among potential users, the weights assigned to the groups who answered "Not Sure" and "Will probably subscribe," respectively, were increased every year by 0.1%¹¹⁾.

〈Table 3〉 IP-TV Service Demand Forecast

(Unit:10,000%)

	2005	2006	2007	2008	2009
Post-ADSL subscribers	300	480	765	945	1,024
Weighted intention to subscribe	12%	18%	25%	31%	37%
IP-TV service subscribers(net increase)	36	88 (52)	189 (101)	293 (104)	382 (89)

As can be noted in 〈Table 3〉 above, post-ADSL subscribers are projected to total 3 million in 2005, and rise to 4.8 million in 2006, and to 10.24 million in 2009. As for the percentage of those who intend to subscribe to an IP-TV service, helped by the increasing level of consumer recognition and word-of-mouth effect, it will increase from 12% in 2005 to 18% in 2006 and to 37% in 2009. Accordingly, IP-TV service subscribers are expected to total 360,000 in 2005, and then to rise to 880,000 in 2006 and to 3.83 million in 2009.

11) For example, if 28% of respondents answered "Not sure," 21% answered "Will probably subscribe", and 1%, "Will definitely subscribe," the weighted probability of subscription would be equal to $(28\% \times 0.1) + (21\% \times 0.4) + (1\% \times 0.9) = 12\%$. Then, the demand for IP-TV service in 2005 would be 360,000 (the weighted probability of subscription (12%) multiplied by the number of Post-ADSL internet subscribers (3 million)). In this case, demand for VOD service is calculated by multiplying the weighted probability of subscription for each year by the number of post-ADSL internet subscribers of the same year.

IV. Conclusions

Broadband internet has emerged in recent years as a medium of an equal importance to terrestrial and cable TV and satellite broadcasting. With the upcoming convergence between telecom and broadcasting, IP-TV, in particular, came to be viewed as a critical medium by both telecom operators and broadcasters. The technological environment is ripe for commercial launch of IP-TV service with connection, network and video compression technologies being all brought to the required level. With a dramatic price decline in related equipment and devices, conditions for a successful commercialization of IP-TV service appear all but united and ready.

In Korea, while the technological environment for launching IP-TV service is ready, and its market potential is already tested and proven, commercialization has been delayed due to a lag at the government policy level. The continuing discord over the regulatory control of the IP-TV market between the Ministry of Information and Communication and the Broadcasting Commission, seemingly unable to agree with each other even on topics like what to call the service is prolonging the situation of uncertainty for prospective service providers, making it difficult for them to undertake investment in the area. In spite of it all, IP-TV is a real boon for telecom operators, especially meaningful at the level of business diversification. By bundling IP-TV with other services, they will be able to quickly gain ground in this market. Being an internet-based service, for broadband internet service providers, it is a lucrative business model requiring little infrastructure investment.

On the other hand, for IP-TV service to become a successful business model, content is what really matters. In addition to retransmission of terrestrial network channels, service providers must come up with other types of content unique to IP-TV. In other words, they must, to begin with, focus on building attractive programs in most popular types of content. This will help drive up revenue from this service, and attract new subscribers. Engaging into the content distribution business might be a good way of effectively procuring quality programs. Next, they must strengthen their capacity as service integrators. To acquire

necessary competitiveness, IP-TV service providers must be able to exercise sufficient influence on sectors related to this service, such as production and distribution of content and distribution of information device.

Once a market is successfully created for IP-TV service, this will provide several new revenue sources for Korean telcos. In addition to the main revenue source made up of subscription fees, monthly service charges and additional types of charges, pay-per-view (PPV) could be another source of income. Leasing and selling set-top boxes or home gateways/servers would be a non-negligible source of revenue as well. Also, like all other services, substantial advertising income can be expected. Finally, security, authentication, billing, payment processing and membership administration services toward CP (content providers) can be quite lucrative.

However, as we discussed earlier in relation to the survey results, for a successful market debut, service providers must look to improve consumer recognition of IP-TV service and provide values attractive enough to win over customers. It is of prime importance that set-top boxes are sold or leased at low prices. From the standpoint of suppliers, it is also vital that they achieve early profitability. For this, service providers need to resort to an aggressive marketing strategy consisting in providing service packages targeting different intended purposes, age groups, sexes and economic and social groups, and also geared to both wired and wireless platforms. Moreover, to maximize revenue, they must encourage consumers to choose subscription-based services, all the while actively providing PPV-type services for sporadic users. With regard to leasing and sales of devices, they must incite customers to commit for long-term leases, and guarantee continuous upgrades to instill trust in consumers as to the value of the services they are purchasing.

IP-TV service is welcomed by many telcos as a means to meet the demand for quality multimedia content, to attract new customers and lock in existing customers, as well as to switch over customers from competitors. It is viewed as a killer service with the potential to drive up ARPU and to provide diversified sources of revenue for ISPs, especially now that next-generation broadband technologies such as VDSL or advanced cable modems have

enabled IP-TV service to deliver DVD-quality high-definition videos. IP-TV is a service closely related to the evolution of the broadband internet subscriber base. Our estimation was therefore based on a post-ADSL subscriber forecast in addition to the results of two consumer surveys on consumer acceptance of IP-TV service. According to this estimation, post-ADSL subscribers is projected to rise from 3 million in 2005 to 4.8 million in 2006 and 10.24 million in 2009, and IP-TV subscribers, to increase from 360,000 in 2005 to 880,000 in 2006 and 3.82 million in 2009.

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