An Empirical Study on Factors Affecting User Recommendation for IPTV

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IPTV companies have extended investments to ensure the subscribers and the government has provided the policy to promote IPTV industry. As a result, approximately 11% of households have subscribed to IPTV services, and this is the second fastest rate in Asia. However, some concerns have emerged that IPTV may take a long time to be spread or fail to diffuse. The reason for this opinion is because subscribers are increasing due to companies' incentive-driven marketing and government's support policies. Until now, much of innovative services had failed in achieving the customer' satisfaction and gone from the market. Therefore, the factors which affect customers' satisfaction should be analyzed to predict the potential of IPTV. Motivated by this concern, an empirical analysis was conducted to reveal the factors which affect user recommendation for IPTV service. This study investigated the effect of five factors for user recommendation and revealed that hedonic experience, QoS, and economic benefits were positively related to the recommendation.

Keywords: IPTV, IPTV adoption, User recommendation

I. INTRODUCTION

Internet Protocol Television (IPTV) is the fastest growing media in the world. Korea was late in providing IPTV services, but is expected to overcome its late start with the help of widespread infrastructure and high utilization rates of Information Technology (IT) services. As of September 2009, three years after the introduction of VoD-based pre-IPTV services and within 1 year of formally launching the service, Korea has 1.85 million subscribers, about 11% of households. This was the second-fastest growth in Asia after Hong Kong but still does not meet expectations, considering the efforts made by the government and telecom companies. A large number of innovative services have failed to diffuse or have disappeared from the market (Moore, 1999). Korea has sufficient infrastructure and technological power to provide IPTV services, but there are some obstacles for the diffusion of IPTV service: CATV

companies' preoccupations, Quality of Service (QoS), user discomfort caused by a complex interface, and cost and price issue. These factors may ensure consumers' passive or negative attitudes toward the IPTV services.

Much of innovative services had been fallen into 'Chasm' or gone from the market due to the customers' dissatisfaction. To predict the potential of IPTV and to prepare the strategies for IPTV, the factors affecting customer evaluation should be analyzed. This study intends to investigate factors affecting user satisfaction in terms of the preference for the recommendation of IPTV.

II. IPTV PENENSTRATION STRATEGY

1. Overview of IPTV

IPTV, a typical example of a convergence service

between telecommunication and broadcasting, is being rapidly developed around the world. IPTV can deliver multimedia services, such as television, video, audio, text, graphics and data, over IP-based networks managed to provide the required levels of service quality, security, interactivity and reliability (Shin, 2009b). Among them, interactivity refers to the abilities provided by a computer-based application to provide the user with both control of the process and communication with content (Newhagen & Rafaeli, 1996; Williams et al., 1988). IPTV uses a two-way communication channel, so a user can interact directly with the content and the service provider. The interactive link between the provider and the user enables individual video streams to be sent to individual devices in the home at the user's request. Through interactivity, users can control the time, face, and sequences of content and enjoy interactive and convenient services. IPTV also enables the delivery of personalized content based on a user viewing history or on an expression of a user's interests. Personalization is the process of tailoring content to an individual user's characteristics or preferences (Deitel et al., 2001). The process gathers user information during interactions with the user for the purpose of delivering appropriate content and services to the user. The system uses information, provided by users and/or collected by the system, to offer a customized experience.

2. Government's Policy for the IPTV Industry

The Korean government established the Korea Communications Commission (The KCC) in 2008. The KCC is the country's broadcasting and telecommunications regulator, similar to Ofcom in the UK. The KCC is actively pursuing the convergence of broadcasting and telecommunications, promoting diverse policies to create future growth of engines, and enhancing the efficiency of society. The reason why government supports IPTV is follow: First is the impact of IPTV on the economy. The IPTV industry forms a complex value chain that consists of content, networks, terminals, and platforms. Therefore, the expansion of IPTV services is expected to promote growth in those related areas. Second, the IPTV industry has a high growth potential. According to Ovum's report in 2008, worldwide IPTV subscribers were forecasted to increase from 11.09 million in 2007 to 64.29 million in 2012. The market is forecasted to grow from $1.8 billion to $17.5 billion during the same period. Third, IPTV maximizes network utilization. The Korean government has built BcN (Broadband convergence Network) to

prepare for the coming ubiquitous information society. Among discussions to take advantages of BcN, IPTV is regarded as an optimum ubiquitous service that combines broadcasting and telecommunications.

The KCC has developed a policy to provide a wide range of public service content through IPTV and established matching funds with public agencies and IPTV service providers to support the development of public content and the implementation of platforms.

3. Telco's Strategies for IPTV

IPTV service in Korea began in the incomplete status. Hanaro Telecom launched VoD-based IPTV services in 2007 before legislation. However, laws regarding IPTV that had been on the table for more than three years finally passed the National Assembly in December 2007 and IPTV service providers were selected in August 2008. In this way, the IPTV age was launched in earnest at the end of 2008.

IPTV service operators are making extensive investments in the new business. KT, the country's largest fixed-line operator, plans to invest 1.2 trillion won ($892 billion) by 2010, while LG Dacom Corp. and SK Broadband plan to inject 916.9 billion won and 1.6 trillion won, respectively, into the IPTV business over the next five years (source: KCC).

Telecom companies have sought to bring bundled services of phone, television, and internet to their customers in one complete package. Bundling services is a key strategy of telecommunications companies to retain existing subscribers and increase new subscribers. IPTV is considered a key component of bundled services, such as TPS (Triple Play Service) and QPS (Quadruple Play Service).

IPTV is a strategic service for telecommunication companies to extend their business area. Until now, the telecom industry has merely been providing telecommunication services and was not concerned with content. Now, as the paradigm of the broadcasting and telecommunication industry is changing from platforms to contents, IPTV can be a good channel for telecommunication service providers to enter the broadcasting and contents industry.

4. Competitive Landscape of the Pay-TV Market

Korea's telecommunications market is one of the fiercest competitions in the world. Three major corporations and over 100 CATV operators provide
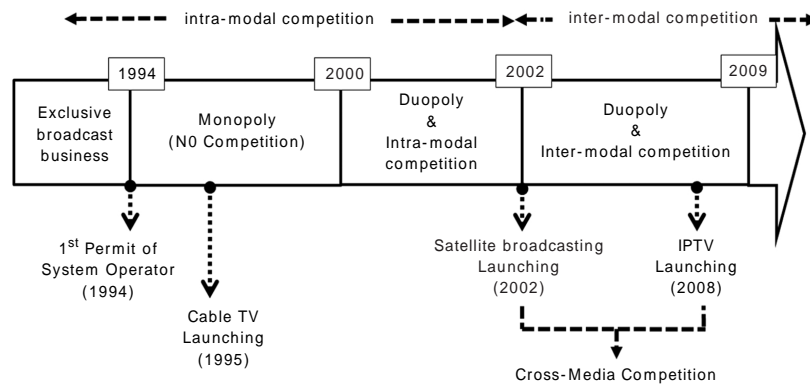
Figure 1. History of pay-TV industry in Korea

broadcast services across the country, but the pay TV market is undergoing significant changes with the launch of IPTV services. The broadcasting-related market is still dominated by cable companies. CATV started its service in 1995 (see Figure 1) and achieved technological stability, winning CATV consumers' satisfaction and loyalty. CATV almost monopolized the pay-TV market with 15,260,000 subscribers as of May 2009 (source: Korea Cable TV Association). This was nearly 90% of the households.

However, CATV operators are concerned about consumer drop-off because TPS includes IPTV, which lowers the price (Park et al., 2009). Kang and Lee (2007) argue that IPTV is functionally similar to existing television services and the Internet, especially in terms of goal-derived similarity, and may replace these services. Sim and Kim (2009) insist that IPTV is estimated as a substitute for CATV or TV and expected to provide various benefits by integrating the demands for communication, information, and entertainment. For a technical level, IPTV and CATV have their respective advantages. IPTV has the capability to provide a virtually unlimited number of channels and the flexibility of developing services. In comparison, digital cable broadcasting provides better video quality, quick channel change response, and a low probability of network hacking (Park, 2009). For that reason, IPTV services seem to be in competition with CATV in pay-TV markets.

5. Penetration Level of IPTV

A sociological theory called Diffusion of Innovations (DoI) has been applied to forecast the demand for an innovative product or service (Rogers, 2003). According to Rogers, the rate of adoption of an innovation is determined by an individual's adopter category. He suggested that there are five categories based on when the individual adopts an innovation. These categories follow a standard deviation-curve. Very few individuals adopt the innovation in the beginning (2.5%). Early adopters make up 13.5% a short time later. The early majority at 34%, the late majority at 34% and, finally, the group lagging behind at 16% make up the rest. The adoption of an innovation follows an S-curve when plotted over a length of time. The diffusion process involves both mass and interpersonal communication channels. Morris and Ogan (1996) insisted that the Internet and cell phones, which combine aspects of mass media and interpersonal channels, represent formidable tools of diffusion. Currently, the number of IPTV subscribers is over 1.8 million, corresponding to 11% of the households in Korea (see Figure 2). According to Rogers' classification, Korean IPTV has reached the stage where it is received by early adopters.

Many services have faced sluggish growth or disappeared from the market. According to Griffin (1997), approximately one in ten product concepts succeed commercially. Moore described the phenomenon in which innovative products are accepted in the initial market but fail to enter the mainstream market as the "chasm" (Moore, 1999). According to Moore, the chasm comes between the early market and the mainstream market, after selling to visionaries and then trying to sell to the early majority, where the main stream market exists. After a company crosses the chasm but before it reaches market leadership in the mainstream, it must pass through the "bowling alley" to get to the mainstream market when the late majority is beginning to accept the product.

Innovators and early adopters hold the key to product diffusion. According to Roger, the nature of networks and
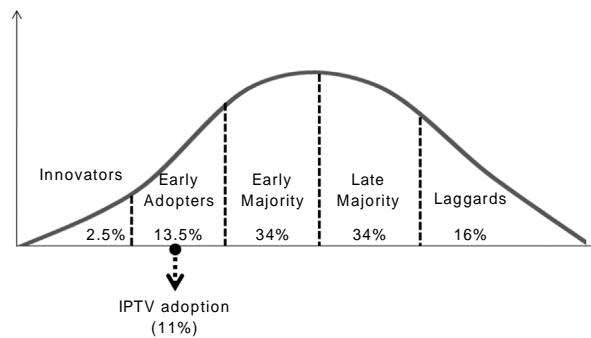
Figure. 2. IPTV Adoption Stage ('09)

the roles opinion leaders play in them determine the likelihood that an innovation will be adopted. The rate of adoption is defined as the relative speed with which members of a social system adopt an innovation. It is usually measured by the length of time required for a certain percentage of the members of a social system to adopt an innovation. Quoting Rogers' diffusion curve, Fidler (1997) argued that a new idea shows an S-shape, and when a new product reaches a market share of 10~25%, it is accepted rapidly in the market. Thus, innovator or early adopter attitudes toward a new product may influence the diffusion of the product. Accordingly, early users' responses or evaluations of a new service are a critical predictor of service success. Therefore, it is necessary to analyze users' evaluation to predict the diffusion of IPTV. Motivated by this concern, this study conducted empirical study to explore the factors affecting user recommendation for IPTV service.

III. AN EMPIRICAL STUDY OF IPTV ADOPTION

1. IPTV Adoption Factors

Most previous studies (e.g., Kang & Lee, 2006; Kang & Lee, 2007; Shin, 2007; Shin, 2009b; Shin et al., 2008; Song et al., 2009) have examined customers' intentions to accept IPTV service. According to Kang and Lee (2007), IPTV users choose IPTV because of its functional similarity to existing media, such as TV, and the expected benefits, such as interactive communication, diversity, convenience, and multitasking. Shin (2007) proved that IPTV adoption is particularly affected by special functionality, individualized content, interactivity, value-added service, compatibility, fixed cost, experience, age

group, and income. Shin, Jeon, and Choi (2008) examined factors that influence mobile TV consumer adoption using an extended TAM model. Their analyses revealed that perceived usefulness, perceived enjoyment, and perceived loss affects user attitude. Shin (2009b) showed the impact of information quality and system quality on consumers' technology experience. Moreover, it is revealed that the perceived quality of content and system had a significant effect on users' perceived usefulness and perceived enjoyment, and social influences had a positive effect on the intention to use IPTV. However, these studies dealt with consumers' intentions to use pre-IPTV services. Now that early adopters have adopted IPTV services, assessments of these current users are needed.

2. IPTV Adoption and User Recommendations

There are many products and services that have failed even with the best technology and service quality. This is because products and services had failed to provide positive user experiences such as satisfaction (Oliver, 1997). Recommendation is an important consequence resulting from positive user experiences (Serenko & Stach, 2009). Loyal customers spread positive word-of-mouth and refer other customers (Reichheld & Sasser, 1990), and positive word-of-mouth can have a favorable impact on a company's profits. Therefore, user's recommendation is a best indicator of user satisfaction and brings attract new customers (Reichheld, 2003).

Recommendations play an important role for a majority of users who adopt a new service upon hearing about it from innovators or early adopters Rogers (2003). For attributes affecting the rate of adoption, Rogers (2003) proposed five attributes of the innovation adoption. The five attributes are relative advantage, compatibility,

Table 1. Factors Affecting User Recommendation of IPTV

Main attributes of the innovation adoption		Related variables
Relative Advantage	the degree to which an innovation is perceived as superior in terms of economic profitability, convenience, or other benefits	Special Functionality Quality of Service Economic Benefit
Compatibility	degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of potential adopters	Hedonic Experience
Complexity	the degree to which an innovation is perceived as relatively difficult to understand and use	Perceived Ease of Use

complexity, trialability and observability. Rogers insisted that relative advantage, compatibility and complexity are the three most important out of five.

Relative advantage is defined as the degree to which an innovation is perceived as superior to the idea it supersedes. An innovation can be superior in terms of economic profitability, convenience, or other benefits. In this study, we derive three variables (special functionality, quality of service, economic benefit) with regard to relative advantage. Compatibility is the degree to which an innovation is perceived as consistent with existing values and past experiences. The hedonic experience is associated with pleasure, arousal, and fun. It is an important and common function of media. Therefore, we set the hedonic experience as independent variable related with compatibility. The complexity of an innovation concerns the degree to which an innovation is perceived as relatively difficult to understand and use. Rogers (2003) stated that the perceived complexity of an innovation is negatively related to its rate of adoption. Perceived Ease of Use (PEoU), one of the two key components of TAM (Technology Acceptance Model) is the opposite concept of complexity. If users cannot manipulate new system or media easily, they may feel frustrated and dissatisfied. Therefore, PEoU is acting as an important factor for user acceptance and satisfaction.

Based on Rogers' study and previous research, we derived factors affecting user recommendation as Table. 1.

2.1. Special Functionality

In general, users perceive new technology as useful when they recognize a positive user-performance relationship. Lin (1994) also argued that the audience may replace an old medium with a new one when a new medium is regarded as more functionally desirable than the old medium. IPTV provides various functions and services. IPTV's greatest value is its ability to offer customers choice and control over content and service with features, such as time shifting, VoD, and interactive services. Song et al. (2009) estimated customers' preferences about the IPTV service using a conjoint designed experiment and four attributes (VOD service; setup cost; information services; and additive services) were investigated. Results of study indicated that customers gave the most importance (34%) to the VOD service when considering subscription to the IPTV service.

Different from broadcasting services that are provided by fixed timetables, IPTV allows its users to view a program when they want. It also maximizes convenience by providing functions, such as pause and scene selection.

With interactivity, users can control time, face and sequences of content and enjoy various interactive services. IPTV allows users to control media (e.g., confirmation, pacing, navigation, inquiry and search) and enjoy interactive services, such as games, e-learning, interactive advertising, and TV-voting. These provide personalized viewer experiences with a high degree of customization, targeted advertising, and high levels of interactivity. These special functionalities of IPTV will likely be considered relative advantages from users' viewpoints and become the most noticeable differences between IPTV and traditional TV or pay-TV. Thus, we hypothesize the following.

• Proposition 1: Special functionality is positively related to user recommendation for IPTV.

2.2. Perceived Ease of Use (PEoU)

In the field of Human-Computer Interaction (HCI), ease of use is a primary determinant for user acceptance of computer applications (Bradley, 1998). PEoU refers to the extent to which a person believes that using a system

would be free of mental effort (Davis, 1989). This is opposite to Rogers' complexity and is positively correlated with the use of consumer technologies, such as computer software (Davis 1989; Venkatesh & Davis 1996). Numerous studies have proven that ease of use preferentially affects the users' intention of accepting a new service and technology.

Current IPTV operation that relies on menu selection or uses a remote controller may seem more complicated than traditional TV or CATV. PEoU can be a critical variable for users' IPTV adoption because, for technology-based services, such as IPTV, the early settlement of services is highly promoted if users can use all functions without difficulty. Thus, we hypothesize the following.

· Proposition 2: Perceived ease of use is positively related to user recommendation for IPTV.

2.3. Hedonic Experience

Most of the studies on use and gratification reveal that hedonic experiences, such as fun, entertainment, passing time, and relaxation, are important benefits sought in broadcasting services and internet access (Lin, 1993; Papacharissi & Rubin, 2000; Rubin, 1994; Song et al., 2004). Hedonic value is defined as the overall assessment (i.e., judgment) of experiential benefits and sacrifices, such as entertainment and escapism (Overby & Lee, 2006). Atkin (1973) argued that mass media content provides a pleasurable sensation, so individuals choose to view mass media content.

Many studies about TV usage reveal that excitement and entertainment are gratification factors of TV (McQuail, Blumler, & Brown, 1972; Rubin, 1994; Lin, 1993). Researchers who studied Internet usage derived aesthetic experiences as gratification factors of the Internet (Papacharissi & Rubin, 2000; Song et al. 2004). Ferguson and Perse (2000) tried to verify whether the use and gratification of Internet websites are similar to those for TV by carrying out a survey using the same questions about gratification that the TV gratification study used. They found that website use plays a role similar to TV in terms of entertainment, passing time, and relaxation. TV was the major source of home entertainment for a long period. Now, IPTV is touted as the future of TV entertainment and is expected to provide more hedonic experiences.

· Proposition 3: Hedonic experience is positively related to user recommendation for IPTV.

2.4. Quality of Service (QoS)

QoS refers to a broad collection of networking technologies and techniques. It includes delay, delay variation (jitter), bandwidth, and packet loss parameters. QoS mechanisms are the best way for different traffics to transfer through the single network and to enable consumers to enjoy smooth and visually excellent IPTV programs. QoS is important for providing guarantees on the ability of a network to deliver predictable results. We hypothesize the following.

· Proposition 4: QoS is positively related to user recommendation for IPTV.

2.5. Economic Benefit

Cost is an important factor for any IT application that often negatively affects the adoption of the application (Kuan & Chau, 2001). In innovation diffusion theory, incentives are motivation factors for increasing the rate of adoption of innovations. Rogers (2003) insisted that direct or indirect financial payment incentives may be used to support individuals of a social system in adopting an innovation. Bundling is the practice of marketing two or more products and/or services in a single package for a special price. According to Guiltinan (1987), bundling can be used to attract new customers, cross-sell existing customers, or retain current customers.

IPTV can attain a discount effect through bundling services, such as TPS and QPS. In Korea, IPTV service providers are giving a discount to users who subscribe for TPS, providing free services for a month each year for long-term subscribers, and paying an incentive to new subscribers. These monetary benefits are powerful ways to attract new users and keep subscribers from defection. We hypothesize the following(See. Figure 3) .

· Proposition 5: Economic benefit is positively related to user recommendation for IPTV.

3. Data Collection and Analysis

To do this study, a total of 31 survey questions were developed. The questionnaire consists of 3 categories: demographic characteristics of respondents (6 questions), IPTV usage and subscribe conditions (6 questions) and measurement items for dependent and independent variables. We used a five-point scale from "very dissatisfied" to "very satisfied". Table 2 provides the
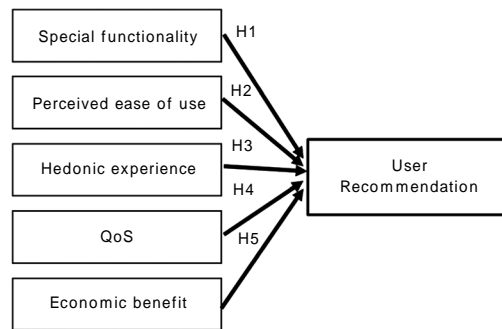
Figure 3. Research Model

Table 2. Measurement Items

Variables	Question
Special Functionality (SF)	I think IPTV provides special services.
	I think VoD service is very useful.
	I think IPTV provides interactive services.
Perceived Ease of Use (PEoU)	It is easy to learn how to manipulate IPTV
	It is easy to manipulate IPTV.
Hedonic Experience (HE)	I enjoy IPTV for pleasure.
	I enjoy IPTV for passing time.
	I enjoy IPTV for relaxation.
QoS (QoS)	IPTV provides stable service without disorder.
	The boot speed is fast.
	I can download contents fast.
Economic Benefit (EB)	IPTV subscription fee is reasonable.
	I perceive IPTV subscription fee is cheap because of bundled service.
	I perceive IPTV subscription fee is cheap because of various incentives (rebates, free services)
User Recommendation (UR)	I'm satisfied with IPTV service.
	I don't regret IPTV subscription.
	I will answer positively when other person asks about IPTV.
	I will recommend IPTV to others.
	I will enjoy IPTV continually.

operational definition and measurement of variables for validation of the research hypotheses. The survey, with all the above variables, used the five point Likert scale for rating (1: not at all to 5: extremely so).

As this study aimed at finding potential features of IPTV which may affect further development and attract more subscribers, in this study we collected relevant data from IPTV subscribers who already experienced diverse features of IPTV. College students, employees who work in non-telecommunication industries and parenting club members participated in the survey. Respondents were asked to evaluate their overall satisfaction with an IPTV service. Data were collected with a web-based self-administered survey and a paper-based survey. The survey was conducted over 8 weeks from August to September 2009 and 232 responses were obtained.

The percentages of males and females were 60.7% and 39.3%, respectively. Among respondents, 11.6% were students, 67.0% were workers, 16.1% were housewives, and 46.4% of respondents had one or more children.

Table 3. Reliability Test

Construct		Number of Items	Cronbach's α value
Independent variables	SF	3	.827
	PEoU	2	.883
	HE	3	.801
	QoS	3	.768
	EB	3	.771
Dependent variables	UR	5	.936

Table 4. Factor Analysis

Question	Factor					
	1	2	3	4	5	6
UR_3	.886					
UR_2	.886					
UR_1	.845					
UR_4	.823					
UR_5	.798					
SF_2		.889				
SF_1		.814				
SF_3		.789				
HE_2			.823			
HE_3			.781			
HE_1			.731			
QoS _3				.859		
QoS _2				.852		
QoS _1				.699		
EB_1					.847	
EB_2					.842	
EB_3					.719	
PEoU_1						.937
PEoU_2						.890
Eigen value	4.138	2.413	2.169	2.127	2.088	1.929
Variance explained (%)	21.781	12.702	11.415	11.195	10.988	10.155
Cumulative variance (%)	21.781	34.483	45.898	57.092	68.080	78.235

Among respondents, 47.3% subscribed to TPS and 42.9% applied for the IPTV service to take advantage of the company discount policy. 60.7% of respondents have been contracted for 3 years in exchange for discount prices. Statistical data analysis was performed using SPSS 17.0 for basic statistical analysis, factor analysis and reliability analysis and regression. According to Nunnally (1978), the minimum acceptable value for Cronbach's is 0.700. Since all were over 0.768, we had a relatively high level of internal consistency (See. Table 3).

For validity testing, we used factor analysis. The principal component was analyzed with a varimax rotation to extract multivariate measures of flexibility and its infrastructural supports. Factor analysis yielded 6 components with eigen values above 1. As a result of analysis, we gain 0.699 to 0.937 and all questions had good loadings on our intended constructs. Results explained 78.24% of variable dispersion (See. Table 4).

Table 5. Correlation Matrix among Factors

	SF	PEoU	HE	QoS	EB
SF	1				
PEoU	.186	1			
HE	.252**	.113	1		
QoS	.002	.283**	.084	1	
EB	.107	.019	.251**	.015	1

(**) Correlation is significant at the .01 level (2-tailed).
(*) Correlation is significant at the .05 level (2-tailed).

Table 6. Summary of Proposition Tests

Independent variables	Std Error	Beta	t	p	VIF
(constant)	.510	-	-.694	.489	1.516
SF	.089	.156	1.814	.072	1.474
PEoU	.077	.039	.481	.632	1.579
HE	.090	.338	3.855	.000**	1.514
QoS	.084	.212	2.602	.011**	1.172
EB	.095	.234	2.893	.005**	1.716
R= 0.601, R^2= 0.362, Adjusted R^2= 0.332, F= 12.015, p= .000, Durbin-Watson= 1.981					

** p .01, * p .05

4. Results of Regression Analysis

Service quality attributes were grouped using factor analysis and their statistical significance was evaluated. The stated and derived importance of each factor for satisfaction was analyzed and results of regression analyses were presented showing relations between satisfaction, factors influencing it and customer behavioral intentions.

Prior to performing the regression analysis, a correlation analysis was performed on the scales to detect multicollinearity problems. Multicollinearity is a state of very high inter-correlations among the independent variables. If independent variables are highly correlated, they might transport essentially the same information. Correlation analysis showed that the largest correlation among the predictor variables is .283. In general, an acceptable collinearity is a value less than .7 (Hair et al., 1998) and as a result, multicollinearity is not a serious problem (See. Table 5).

Propositions 1, 2, 3, 4, 5 were tested through multiple regression analyses to determine significant contributions of IPTV on user recommendation. Table 6 summarizes the analysis results. The adjusted R^2 value was 0.332 (F= 12.015; p= .000) indicating 33.2% of the variance in the

response was explained by the model. As a result of regression analysis, hedonic experience, QoS, and economic benefits were positively related to user recommendation. Hedonic experience had a significant relationship with user recommendation while watching IPTV (t= 3.855, p .01). QoS also had a significant relationship with user recommendation (t= 2.602, p .01). Proposition 5, proposing that economic benefits were positively related to learner satisfaction was supported (t= 2.893, p .01). However, special functionality and PEoU did not have any significant relationship with user recommendation in our study (t= 1.814, p .05; t= .481, p .05).

5. Summary of Findings

In this study, we collected data from IPTV subscribers because this study intends to find factors affecting users - specifically IPTV subscribers - recommendation for IPTV attracting non IPTV subscribers at the moment. This study revealed that subscribers who satisfied with hedonic experience, QoS, and economic benefits of IPTV services seemed to positively recommend to others.

Mass media have penetrated more and more domains of daily life and entertainment products will expand

further in the future (Vorderer et al., 2004). People tend to find their new hobbies and pleasure in media rather than through outdoor leisure activities. IPTV has long been touted as the future of television entertainment. A strong broadband infrastructure and variety of cultural content have made it possible for us to enjoy entertainment activities through IPTV. Successful deployment of IPTV services requires excellent QoS for video, voice, and data. In IPTV services, problems in QoS can be important factors in users' defection from services. Slow downloading and breaks in real-time broadcasting are causing customer complaints. Without solving these problems, IPTV will be at a disadvantage in its competition with CATV, which has won consumer confidence through stable technology.

In Korea, IPTV service providers are executing aggressive marketing strategies such as providing free opportunities to experience IPTV service, lowering the price through TPS, and giving incentives under the service contract. These strategies seem to be effective in attracting subscribers. Our survey revealed that economic benefits affected customer satisfaction. According to the results, 17% of respondents answered that they sign up because of incentives and 42.9% of respondents choose a discount through TPS. In contrast, only 28.6% of respondents answered that they applied for services for need.

In our study, special functionality and PEoU did not have significant relationships with user recommendation because IPTV does not provide real interactive service yet. Interactivity is a key element to realizing the various benefits of IPTV, because IP-based media provides significant opportunities to make the TV viewing experience more interactive and personalized. IPTV operators prepare interactive services that are currently unavailable through conventional television. These interactive services are relative strengths of IPTV over CATV. If interactive services can be made available faster, IPTV expansion is expected to increase and the interactive and value services will push the market. Also, complex manipulation problems of IPTV need to be solved. One of the major advantages of IP-based media such as the Internet and IPTV is their ability to offer various forms of interaction. Unlike TV, which is a passive medium with unidirectional programs, IPTV enables users to control information usage and participate in bidirectional activities. However, current IPTV service menus are confusing and operation for interactive services is difficult. To enjoy the benefits of IPTV including interactive services, the User Interface (UI) needs to be user-friendly. A good interface enhances users' experiences based on a number of user criteria, including physical characteristics, gender, age, knowledge level and technical capability. The remote controller also needs to be easier to use for enjoyable interactive services. Based on the finding, this study provides the implications regarding which features should be further developed to get potential customers.

IV. CONCLUSION

When new services form a new market, various stakeholders such as government, related industry or operators, competitors exert influence on the formation of market. IPTV has penetrated the market relatively quickly, there are some concerns that the increase in the number of subscribers cannot be sustained without the governments' support and Telco's incentive-driven marketing.

Many innovative services have not entered the mainstream market and instead have faced sluggish growth or disappeared from the market. The reason for this phenomenon can be explained by customers' dissatisfaction. Indeed, IPTV has not fulfilled expectations of user in the aspect of the function and services. If IPTV cannot provide higher benefits to CATV subscribers, they would not switch services without assurances. If paid subscribers are unsatisfactory, they would terminate services.

This study investigated the effect of five factors for user recommendation and revealed that hedonic experience, QoS, and economic benefits were positively related to user recommendation. The hedonic experience is related to mental relaxation and entertainment, and these are important functions of media. CATV companies have an advantage in providing popular content thanks to Program Provider (PP) belong to the same value chain. Therefore, IPTV companies should establish strategies to provide content which can meet customer's needs and expectations. The second is the quality control problems. The video quality of IPTV is worse for terrestrial TV than that of digital cable TV due to the inherent nature of trans-coding from MPEG-2 to MPEG-4 (Park, 2009). Not only the low video quality of IPTV services, its slow booting speed also can be a cause of customers' dissatisfaction. To solve these problems, corporate investment for technology development and research efforts are needed continually. Finally, pricing should be set strategically. Cost and pricing have an important influence on both the corporate

growth and adoption. In the current situation, which there is no perceived functional difference between CATV and IPTV service, relatively low subscription fee of CATV can be an obstacle for IPTV market growth. Lowering the subscription fees and providing rebates are a great way to recruit subscribers, however, these strategies can be a heavy burden for companies which should continually invest in equipment and infrastructure.

This study introduces an empirical study to investigate factors which have an effect on user recommendations at the stage of innovators' and early adopters' adoption according to Rogers' classification. Unlike most other papers, the study was conducted among IPTV subscribers, so the result of this study has implications for empirical studies. However, a limitation of this study is the lack of theoretical background such as TAM and TRA. Variables which were presented in this study come from previous research, not from the theory. In the near future, therefore, a more in-depth and comprehensive study about adoption and customers' satisfaction of IPTV will be needed based on the theories. Another limitation is sample selection bias. As this study collects data from IPTV subscribers, the investigation is limited in finding potential factors among currently known candidate features of IPTV which need to be paid attention. Thus the finding in this study may not be interpreted as every factor affecting all customers including non-IPTV subscribers. Rather it should be interpreted as factors affecting current IPTV subscriber's satisfaction on IPTV services and, therefore, leading to recommendation for IPTV subscription. To compensate this limitation, in the future, there should be a study investigating all potential factors which may attract non IPTV subscribers as well as current IPTV subscribers.

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