

An Empirical Study on the Factors Influencing Usage Intention of IPTV in Korea

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Abstract: This study examines the factors influencing IPTV (internet protocol television) usage intention. Using Davis's technology acceptance model (TAM) and DeLone and McLean's model of information system success, this study investigates the effects of information system quality (information quality, system quality, and service quality) and media quality on IPTV use in terms of perceived usefulness, perceived ease of use, and usage intention. We examined the proposed model by employing structural equation modeling and survey data from 222 IPTV users. The results indicate that information quality, service quality, and media quality had significant effects on perceived usefulness and that information quality and media quality had significant effects on perceived ease of use. However, system quality had no effect on perceived usefulness and perceived ease of use. In addition, perceived ease of use influenced perceived usefulness, and perceived usefulness and perceived ease of use influenced IPTV usage intention. Further, the stability and reliability of IPTV services induced IPTV use, and successful IPTV services showed high media quality.

1 INTRODUCTION

Recently, IPTV (internet protocol television) has emerged as a new broadcast medium, following terrestrial, satellite, and cable broadcast networks, and has become a basis for the convergence of broadcasting and communications based on Web 2.0. IPTV, unlike traditional broadcast media, generally faces no bandwidth limitations, which allows it to provide large numbers of channels.

Given the rapidly increasing number of IPTV subscribers and the expansion of the IPTV market, there has been growing research interest in IPTV. A number of studies have examined customer satisfaction and usage intention with respect to IPTV services. In addition, some studies have analyzed the effects of government policies on the acceptance of IPTV, and others have examined the activation of IPTV services. These studies have typically focused on the quality of IPTV services, and thus, little is known about the media properties of IPTV.

The objective of the present study is to identify the factors that induce users to adopt IPTV, including information quality, system quality, and service quality. In addition, the study examines the effects of these factors and media quality on perceived usefulness, perceived ease of use, and

usage intention with respect to IPTV services. For this, the study employs Davis's technology acceptance model (TAM) and DeLone and McLean's model of information systems success.

2 LITERATURE REVIEW

2.1 IPTV

IPTV is an internet-based TV service providing all the services of traditional media (e.g., data, videos, songs, and TV programs) through the IP.

The International Telecommunication Union defined IPTV as "*multimedia services such as television/video/audio/text/graphics/data delivered over IP based networks managed to provide the required level of quality of service and experience, security, interactivity and reliability.*" In commercial environments, IPTV has been widely deployed for live TV, video channels, and VOD (video on demand) through LAN/WAN IP networks based on QoS control. Due to the technical requirements of IPTV, security robustness is needed to ensure the quality, reliability, and availability of IPTV services (Bilgehan and Matthews, 2008); (Jang and Noh, 2011).

2.2 TAM

The technology acceptance model (TAM), an information system (IS) framework proposed by Davis (1989), is one of the most influential extensions of Ajzen and Fishbein's theory of reasoned action (TRA). TAM replaces many of the TRA's attitude measures with two technology acceptance measures: ease of use and usefulness (Ajzen and Fishbein, 1980).

Davis et al. (1989) proposed perceived usefulness and perceived ease of use as important prerequisites for inducing the actual use of computer systems and defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance" and perceived ease of use as "the degree to which a person believes that using a particular system would be free from effort." A number of studies have examined and expanded TAM, and thus perceived usefulness and perceived ease of use are well known to be important explanatory variables for information technology acceptance (Davis et al., 1989).

2.3 Information System Quality

With the development of information technology, previous studies have examined IS quality from various perspectives.

DeLone and McLean's (1992) seminal study of IS quality provided the key factors in IS success. According to their model of information system success, IS quality includes system quality, information quality, and service quality, and these factors have considerable influence on usage intention, user satisfaction, and the total effect (net income) (DeLone and McLean, 1992).

2.4 IPTV Media Quality

Katz et al.'s (1974) uses and gratifications theory is a popular framework for understanding mass communication (Jarvenpaa and Todd, 1966); (Lin and Lu, 2000).

This theory focuses more on consumers or audiences than on actual messages by asking "what people do with media," not "what media does to people" and suggests that people's needs influence what media they choose; how they use certain media; and what gratification they find in media. First, audiences are conceived as active participants, i.e., an important part of mass media use is assumed to be goal-oriented. Second, media compete with

other sources of customer satisfaction. Third, people are sufficiently self-aware and are thus able to verbally report their interests and motives in particular cases (or at least to recognize them) when confronted with them in an intelligent and familiar manner. Fourth, value judgments about the cultural importance of mass communication should be suspended while the audience's orientation is explored on their own terms.

3 RESEARCH METHODOLOGY

3.1 Research Model

This study examines the effects of IS quality and media quality on IPTV usage intention. For this, the study proposes a research model based on Davis's TAM and DeLone and McLean's model of IS success.

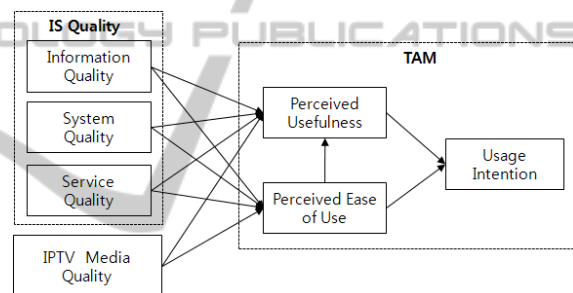


Figure 1: Research model.

3.2 Research Hypotheses

To identify the factors influencing IPTV usage intention, this study uses Davis's TAM and DeLone and McLean's model of IS success. In addition, this study investigates the effects of IS quality and media quality on IPTV use in terms of perceived usefulness, perceived ease of use, and usage intention (Shin, 2009); (Venkatesh and Davis, 2003). In this regard, we propose the following hypotheses:

H1.1: Information quality has a positive effect on perceived usefulness.

H1.2: Information quality has a positive effect on perceived ease of use.

H2.1: System quality has a positive effect on perceived usefulness.

H2.2: System quality has a positive effect on perceived ease of use.

H3.1: Service quality has a positive effect on perceived usefulness.

H3.2: Service quality has a positive effect on perceived ease of use.

H4.1: Media quality has a positive effect on perceived usefulness.

H4.2: Media quality has a positive effect on perceived ease of use.

H5: Perceived ease of use has a positive effect on perceived usefulness.

H6: Perceived usefulness has a positive effect on usage intention.

H7: Perceived ease of use has a positive effect on usage intention.

4 RESULTS ANALYSIS

4.1 Sample and Survey Research Methods

For the determination of factors influencing IPTV use, users with IPTV experience were selected for the survey. The questionnaire items, which were based on previous research, were modified by professionals (headquarters, technical and sales staff members at KT, a major IPTV service provider in Korea) with knowledge of IPTV systems. For the reliability and validity of the questionnaire items, a pretest was conducted with 32 individuals who used IPTV services for at least six months.

Of the 300 questionnaires distributed, 252 were returned. However, 30 were not complete or lacked a sufficient understanding of IPTV services, and thus, they were excluded, resulting in a total of 222 respondents.

Among the 222 respondents, 129 (58.1%) were males; approximately 60% were in their twenties and thirties; 63 (28.4%) were students; and majority (63.5%) of respondents had a bachelor's degree. In terms of the representative IPTV operators in Korea (KT, SK Broadband, and LG Telecom), most respondents (56.3%) used KT. In addition, approximately 74% used IPTV for less than 6 months.

4.2 Reliability and Validity Analysis

As shown in Table 1, we analyzed the measurement items for their reliability and validity.

4.3 Hypothesis Testing

We tested each hypothesis by using PLS Graph and examining the path coefficients. The estimated path

effects, together with their level of significance, are given. Table 2 summarizes the results.

Table 1: Reliability and validity analysis.

Variables	Item	Factor Loading	AVE	ICR	Cronbach's α
Information Quality	IQ1	.832	.677	.893	.841
	IQ2	.876			
	IQ3	.789			
	IQ4	.791			
System Quality	SYQ1	.795	.613	.863	.788
	SYQ2	.847			
	SYQ3	.741			
	SYQ4	.743			
Service Quality	SEQ1	.785	.621	.891	.847
	SEQ2	.818			
	SEQ3	.823			
	SEQ4	.748			
	SEQ5	.761			
IPTV Media Quality	MQ1	.724	.558	.833	.732
	MQ2	.822			
	MQ3	.815			
	MQ5	.607			
Perceived Usefulness	PU1	.871	.689	.868	.773
	PU2	.883			
	PU3	.727			
Perceived Ease of Use	PE1	.821	.706	.906	.862
	PE2	.857			
	PE3	.846			
	PE4	.837			
Usage Intention	INT1	.805	.765	.907	.845
	INT2	.911			
	INT3	.905			

Table 2: Hypothesis test results.

Channel	Path Coefficient	t value	Test Results
H1.1	Information Quality -> Perceived Usefulness	0.200	2.846*** Supported
H1.2	Information Quality -> Perceived Ease of Use	0.206	2.462*** Supported
H2.1	System Quality -> Perceived Usefulness	0.027	0.355 Rejected
H2.2	System Quality -> Perceived Ease of Use	0.083	0.840 Rejected
H3.1	Service Quality -> Perceived Usefulness	0.261	3.018*** Supported
H3.2	Service Quality -> Perceived Ease of Use	0.039	0.312 Rejected
H4.1	IPTV Media Quality -> Perceived Usefulness	0.394	4.746*** Supported
H4.2	IPTV Media Quality -> Perceived Ease of Use	0.240	3.014*** Supported
H5	Perceived Ease of Use-> Perceived Usefulness	0.179	2.857*** Supported
H6	Perceived Usefulness-> Usage Intention	0.486	8.444*** Supported
H7	Perceived Ease of Use-> Usage Intention	0.366	6.184*** Supported

Significance level: ***: p<0.01

5 CONCLUSIONS

We examined the factors influencing IPTV use by employing Davis's TAM and DeLone and McLean's model of IS success, which are widely used in IS research. Based on these models, we considered a research model including media quality, and with a sample of 222 IPTV users, we tested a set of hypotheses about IPTV use. The results are summarized as follows.

First, information quality, service quality, and media quality had significant effects on perceived usefulness, but system quality had no such effect on perceived usefulness. Second, information quality and media quality had significant effects on perceived ease of use, but system quality and service quality did not influence perceived ease of use. Third, perceived ease of use influenced perceived usefulness, and perceived usefulness and perceived ease of use influenced usage intention. These results indicate that the stability and reliability of IPTV services can induce IPTV use and that high media quality can facilitate IPTV success.

The results have a number of important implications. First, we examined the factors influencing IPTV use by combining the media attributes of IPTV with Davis's TAM and DeLone and McLean's model of IS success. Second, media quality was most likely to influence perceived usefulness and perceived ease of use. Unlike traditional media, IPTV is based on a wide range of new and unique elements, particularly in terms of its interactivity, content diversity, ease of use, and multitasking capability. Therefore, IPTV service providers should pursue aggressive customization. Third, information quality had a positive effect on perceived usefulness and perceived ease of use, suggesting that IPTV service providers should continuously update their content and provide accurate information to ensure customer satisfaction. Finally, service quality had a significant effect on perceived usefulness. Thus, IPTV providers should provide reliable after-sales as well as before-sales service and facilitate collaboration between relevant departments (e.g., sales and technical support) to provide informal and technical aspects based on prompt service and appropriate expertise.

This study has some limitations. First, IPTV system were studied using only DeLone and McLean (2003)'s variables and IPTV media quality with external variables (DeLone and McLean, 2003). In this regard, future research should examine the relationship between the characteristics of potential users of IPTV and their acceptance of IPTV. Second, system qua-

lity had no significant effects on perceived usefulness and perceived ease of use, which indicates a need for developing items that could better reflect the attributes of IPTV system quality. Third, for more practical strategies for inducing IPTV use, future research should emphasize the strategic aspects of study.

REFERENCES

- Bilgehan, E., Matthews, E. P., 2008, "Analysis and realization of IPTV service quality," *Bell Labs Technical Journal*, 12(4), pp.195-212.
- Davis, F. D., 1989, "Perceived usefulness, perceived ease of use, and user-acceptance of information technology," *MIS Quarterly*, 13(3), pp. 319-340.
- Davis, F. D., Bagozzi, R. P., Warshaw, P. R., 1989, "User acceptance of computer technology: A comparison of two theoretical models" *Management Science*, 35(8), pp. 982-1003.
- DeLone, W. H., McLean, E. R., 1992, "Information system success: The quest for the dependent variable," *Information Systems Research*, 3(1), pp. 319-340.
- DeLone, W. H., McLean, E. R., 2003, "The DeLone and McLean Model of information success: A ten-year update," *Journal of Management Information System*, 19(4), pp. 9-30.
- Jang, H. Y., Noh, M. J., 2011, "Customer acceptance of IPTV service quality," *International Journal of Information Management*, 31(6), pp.582-592.
- Jarvenpaa, S. L., Todd, P. A., 1997, "Consumer reactions to electronic shopping on the World Wide Web," *International Journal of Electronic Commerce*, 1(2), pp. 59-88.
- Katz, E., Blumler, J. G., Gurevitch, M., 1974, *Utilization of Mass Communication by the Individual*, In Blumler, J. G. and Katz, E.(eds), *The Use of Mass Communication*, Beverly Hills, CA: Sage.
- Lin, J. C. C., Lu, H., 2000, "Towards an understanding of the behavioral intention to use a web site," *International Journal of Information Management*, 20(3), pp. 197-208.
- Shin, D. H., 2009, "An empirical investigation of a modified technology acceptance model of IPTV," *Behavior & Information Technology*, 28(4), pp. 361-372.
- Venkatesh, V., Davis, F. D., 2000, "A theoretical extension of the technology acceptance model: Four longitudinal field studies," *Management Science*, 46(2), pp. 186-204.