Perceived Reliability and Technology Acceptance of Realistic Media Service

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Abstract. Realistic media service, as one of new leading application services, provides converged multimedia contents with presence and immersion via Internet. With the development of information and communication technology, most customers are interested in acceptance and use of realistic media service. This paper examines the influence of perceived reliability and technology acceptance on usage intention of realistic media service. A research model is suggested by integrating the original technology acceptance model and perceived reliability, which is recognized as an important factor to measure user perception for online realistic media service. The results of data analysis showed that perceived ease of use, perceived reliability, and perceived usefulness influence positively on usage intention of realistic media service. This study provides an insight to complement the prior studies with empirical evidence.

Keywords: Realistic Media Service; Technology Acceptance; Perceived Reliability; Perceived Ease of Use; Perceived Usefulness; Usage Intention

1 Introduction

Realistic media service industry appears as a new business to create higher value through convergence skill of broadcasting and telecommunication with the development of ICT. A lot of media services in a variety of industry, such as tourism, culture, history, education, medical industry, were suggested for introduction and use of new technology in media service. Multidimensional immersive media service through Digital TV and 3D TV as a service of next generation enables user to feel with immersion and presence, providing an effective bridge-builder of broadcasting service. Realistic media services have received a lot of attention to apply to public service.

Korean government, which was ranked top 5 in global e-Government readiness survey by UN, provides world's most sophisticated e-Government services based on broadband information network. It provides government policy and public information service as well as civil services through central and local government web sites. However, its readiness for public media services was not enough to provide two-way media services. Especially, pilot projects of realistic public service from

2008 to 2011, were conducted in areas of culture and tourism, education, healthcare, misfortune disaster, and environment in South Korea.

Lots of studies on media service technology were conducted in research institutes and universities, which they were focused on the development of core technologies related to realistic media service, such as high efficiency transcoding, 3D display, holography, network, 4D authoring tool for immersive effect and immersion devices. Few studies on media service trend suggested combined service models with realistic media. Public services based on convergence of broadcasting and telecommunication could provide useful and easy-to-use environment for public services by using TV at home, as one of the most familiar media for people.

The purpose of this paper is to suggest an extended research model to integrate the original TAM with perceived reliability, and to identify the relationship between the influencing factors and consumer's usage intention of realistic media service. To achieve research objectives, we tried to explain the types of the public media services for citizens in pilot project area of South Korea. And then, we investigated behavior intention of citizens to use realistic media service with data collection of pilot services. This study contributes to enhance the knowledge on technology acceptance of realistic media service and to understand the importance of perceived reliability on new media service.

2 Literature Review and Hypothesis Development

2.1 Adoption Behavior on Realistic Media Service

Realistic media service is defined by Park and Song [9] as "next generation media to maximize the effect of media convergence, which provides useful and easy-to-use digital realistic contents through network of broadcasting and telecommunication by using smart devices without time and space limit". The development and diffusion of realistic media service also contributes to grow up media-related industry and new business opportunities by promoting people to accept and use new media service. Jarvenpaa et al. [6] explored the cross-cultural effect on electronic-commerce adoption and revealed that attitudinal beliefs can be predicted through TAM. Chau and Hu [1] asserted that consumer adoption behavior and attitude towards proliferation of the new technology can be predicted, explained, and theorized under the theoretical paradigm of TAM.

Public services based on convergence of broadcasting and telecommunication could provide useful and easy-to-use environment for public services by using TV at home, as one of the most familiar media for people. The development and diffusion of realistic media service also contributes to grow up media-related industry and new business opportunities by promoting people to accept and use new media service. In the case of medical media service, contents delivery consists of personal medical record, body check, drug, clinical history with sensitive meaning. Also, data transfers might occur frequently. In this case, reliability of data and media service is one of most important factors. In another case of media service on disaster and emergency

by weather, because of contents provides information on weather, urgent situation, and emergency preparedness, reliability of disaster media service is higher in order than others.

Based on the perspective of technology acceptance model [2], few studies were conducted on consumer acceptance of E-government and E-commerce [4]. From the original TAM perspective, this situation may make it difficult to understand the real phenomenon. Perceived usefulness and perceived ease of use as mediated variables to explain behavioral intention are pointed out as a limitation to explain usage intention of consumer. Given the expanding role and importance of perceived reliability in using realistic media service for public purpose, it is imperative to enhance the understanding of factors that may affect consumers' behavioral intention to use realistic media service. Based on the above discussion, perceived reliability as one of special characteristics for public media service, needs to consider for extending the original model of customer's adoption behavior. Figure 1 provides a research model in this study
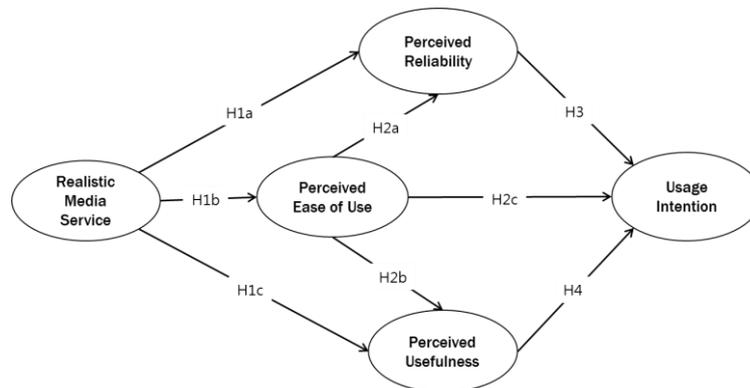

Fig. 1. Research Model

2.2 Influence of Realistic Media Service

Realistic media is increasingly used not only for the application area of broadcasting and entertainment, but also for new industry like exhibition and game using computer graphics, because realistic media have better expressiveness, realism, presence, immersion than existing media. Most studies about realistic media focused on technological issues and market trend, and there is no user view or service view on how to accept and use. Extensive studies have found reliability to be important in determining service quality [7]. Market expansion requires the growth of supplies and demands essentially. Elliott et al. [3] argued that technology readiness has positive influence on perceived reliability in acceptance of self-scanning technology. Thus, we hypothesize the relationship between realistic media service and user's perception on reliability and ease of use, and usefulness.

[H1a] Realistic media service has a positive effect on perceived reliability.

[H1b] Realistic media service has a positive effect on perceived ease of use.
[H1c] Realistic media service has a positive effect on perceived usefulness.

2.3 Perceived Ease of Use

TAM theorizes that the effects of external variables (e.g. system characteristics, development process, training) on intention to use are mediated by perceived usefulness and perceived ease of use [2]. Accordingly, perceived usefulness is also influenced by perceived ease of use, if other things being equal under the same condition, the easier the system use, the more useful it can be. So, perceived usefulness is such a fundamental factor of usage intention with 60% explanation of variance. Reliability is a serious concern for consumers seeking online services from any organization. There has been demand for high reliability/availability and maintainability of systems [10]. Thus, we hypothesize the relationship between perceived ease of use and user's perception on reliability and usefulness, and usage intention.

[H2a] Perceived ease of use in realistic media service has a positive effect on perceived reliability.
[H2b] Perceived ease of use in realistic media service has a positive effect on perceived usefulness.
[H2c] Perceived ease of use in realistic media service has a positive effect on usage intention

2.4 Perceived Reliability and Perceived Usefulness

Perceived reliability is an important variable in technology acceptance [4] and refers to 'the correct technical functioning of technology' [3]. There are few researches about the impact of perceived reliability. Perceived reliability can be conceptualized as the extent to which users of the interactive IT believe that the IT is reliable for transmitting important information among users and keeping personal and private information secure. Perceived reliability is critical to user satisfaction and usage intentions on the interactive IT because it reflects a capability of the IT to perform the promised service dependably, safely, and accurately [8]. Thus, we hypothesize the relationship between perceived reliability and usage intention.

[H3] Perceived reliability in using realistic media service has a positive effect on usage intention

Among the various efforts to understand and predict the process of user acceptance or adoption of information systems, the TAM introduced by Davis [2] is one of the most cited theoretical frameworks in the area of information systems. Davis [2] defined that perceived usefulness is 'the degree to which a person believes that using a particular system would enhance user's job performance'. Han and Moon [5] also investigated continuous intention to use of IPTV service using TAM, and they found significant relationship between perceived usefulness and continuous usage intention. Thus, we hypothesize the relationship between perceived usefulness and usage intention.

[H4] Perceived usefulness in using realistic media service has positive impact on perceived satisfaction.

3   Research Design and Data Analysis

3.1 Sampling

Based on literature review, we adopted operational definition from prior studies. All measurement items were measured by five-point Likert-type scales with ranging from strongly disagree to strongly agree. Data for this study were collected from potential users of a regional province of South Korea. We surveyed for two months with support of Provincial Government of Gyeongsangbuk-Do. A total of 1,000 were mailed for citizens living in the province. 404 respondents of 421 replied questionnaires were usable with approximately 42% of the response rate. Table 1 indicates the demographics statistic of 404 respondents.

Table 1. Sample Statistic

	Item	Frequency	Percent	Realistic Media Services	Mean	S.D.
Gender	Male	232	57.4%	Media Service on Environment	3.75	0.822
	Female	170	42.1%			
	Non-response	2	0.5%	Media Service on Health Care	3.89	0.860
	~19	2	0.5%			
Age	20~29	40	9.9%	Media Service on Disaster and Emergency	3.96	0.883
	30~39	143	35.4%			
	40~49	142	35.1%	Media Service on Residential safety	3.93	0.899
	50~	77	19.1%			

3.2 Validity and Reliability

We have employed SPSS 20 and Smart PLS 3.0 for data analysis. Confirmatory factor analysis was conducted to present the value of estimates. And AVE (0.5) and Cronbach's alpha (0.7) was conducted for validity and reliability of each construct. All indicators loaded much higher than its cut-off value.

3.3 Hypothesis Testing

Table 2 reports the results of the hypothesis testing. All hypotheses are accepted with significant level. Realistic media service has a positive impact on the perceived reliability, perceived ease of use, and perceived usefulness respectively. Perceived ease of use has a positive impact on the perceived reliability and perceived usefulness, and usage intention respectively. Usage intention influenced by perceived ease of use, perceived reliability, and perceived usefulness, jointly was explained 43.3% of the variance by realistic media service.

Table 2. Result of Hypotheses Test

	Hypothesis	Path Coefficients	S.E.	T-value	P-value	R^2	Result
H1a	Realistic Media Service → Perceived Reliability	0.218	0.048	4.495	***	-	Accepted
H1b	Realistic Media Service → Perceived Ease of Use	0.401	0.054	7.381	***	0.161	Accepted
H1c	Realistic Media Service → Perceived Usefulness	0.256	0.058	4.409	***	-	Accepted
H2a	Perceived Ease of Use → Perceived Reliability	0.486	0.044	11.098	***	0.368	Accepted
H2b	Perceived Ease of Use → Perceived Usefulness	0.242	0.055	4.435	***	0.174	Accepted
H2c	Perceived Ease of Use → Usage Intention	0.271	0.052	5.201	***		Accepted
H3	Perceived Reliability → Usage Intention	0.377	0.052	7.230	***	0.433	Accepted
H4	Perceived Usefulness → Usage Intention	0.163	0.051	3.209	***		Accepted

* $P<0.1$, ** $P<0.05$, *** $P<0.01$

4 Discussion and Conclusion

This study tried to suggest a theoretical framework to explain which factors influence on technology acceptance of realistic media service. From prior literatures, we have identified that realistic media service can influence on usage intention through perceived ease of use and perceived usefulness, which are major critical factors of TAM, suggested by Davis [2]. With the importance of reliable service in using realistic media service for public purpose, we adopted perceived reliability as one of additional factors that affect consumer's behavioral intention to use realistic media service.

According to the results of this study, TAM is very useful in identifying user acceptance and usage intention of realistic media service, like previous studies on media acceptance. We also identified the expanding role and importance of perceived reliability in using realistic media service for public purpose. The extended model of TAM with the relationship between perceived ease of use, perceived usefulness, and usage intention, had been strongly supported to account for 40~60% of the variance in usefulness perceptions and 34~52% of the variance in usage intentions [39]. The results of our study showed that the variance in usefulness perceptions could account for less than 30%. However, this study showed that the variance in usage intention of customer could account for more than 60% in prior studies. This study contributes to provide an insight not only to understand real phenomenon of new media service, but also to complement the prior studies with empirical evidences.

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