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Effect of Location-Based Services Characteristics on Purchase Intention

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***Abstract*—This study presents the characteristics influencing purchase intention for Location-based Services (LBS) in South Korea. A research model was developed based on the Technology Acceptance Model (TAM) applied to LBS user in South Korea to identify the LBS purchase intention factors and TAM perspectives. Appropriate measures were developed and tested on 220 LBS users in South Korea. The results were examined to identify significant factors affecting LBS technology acceptance intention. The results indicate that LBS users are more likely to adopt LBS that include location awareness, ubiquity, reputation, trust, and entertainment. In addition, attitude was found to play a significant positive role, as was the user's purchase intention.**

***Keywords*—Location-Based Services (LBS), Technology Acceptance Model (TAM), Purchase Intention**

I. Introduction

Recent advances in mobile communication technologies are ushering in the next generation of itinerant e-commerce applications. The development of positioning technologies such as GPS and cellular triangulation techniques, has not only provided consumers with unprecedented accessibility to network services while on the move, but also enabled the localization of services. These services include emergency and safety-related services, location-sensitive billing, entertainment, navigation, asset tracking, directory and city guides, traffic updates, and location-based advertising [13].

The number of smartphone users is increasing rapidly because smartphone provide available anytime, anywhere Internet access and offer excellent multimedia processing performance. Location-based service sectors are receiving the most attention in mobile application services using smartphones. Location-Based Services (LBS) are rapidly emerging services in the ubiquitous computing era.

Most previous research studies have addressed privacy concerns in LBS. They are mainly concerned with the effect of privacy concerns on LBS user behavior. There have been studies on intention to disclosed personal information [13], [16], intention to use LBS [12], and usage intention in LBS [17].

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There have also been studies on intention to use Permission-Based Location-Aware Mobile Advertising (PBLAMA) [10], and purchase intention in Location-Aware Marketing (LAM) [14]. There is a lack of research regarding purchase intention using the Technology Acceptance Model (TAM) for LBS.

Thus, this paper will focus on factors affecting the purchase intention for LBS using the TAM in South Korea. Based on the five factors (location awareness, ubiquity, reputation, trust, and entertainment) of this model theoretically justified as having influence on attitude, a research model for the investigated TAM was developed and empirically examined. The model uses responses about users' intended LBS purchases. The specific purposes of this study are as follows. First, this study identifies LBS characteristics: location awareness, ubiquity, reputation, trust, and entertainment. Second, this study investigates the relationships among LBS characteristics, attitude, and purchase intention. This study will provide LBS providers with significant and strategic insights for identifying the purchase intention for LBS in South Korea.

II. Research Model and Hypotheses

Figure 1 shows a research model that provides the strategic rationale for including characteristics in the analysis of users' purchase intention for LBS.

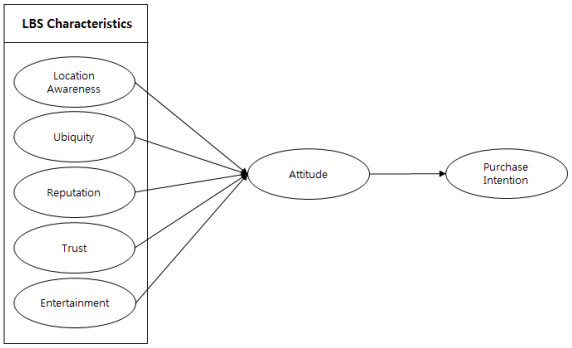

Figure 1. Research model

LBS are network-based services that integrate a derived estimate of a mobile device's location or position with other information to provide added value to users. They can access the mobile Internet to acquire information and services at

anytime from anywhere. This study classifies location awareness, ubiquity, reputation, trust, and entertainment as LBS characteristics.

Smartphones can be located by the telecommunications operators within the network. Location awareness enabled by positioning and timeliness is a key advantage used to entice consumers to exchange their personal information for gaining flexible access to needed information or services at anytime from anywhere [13]. In the LBS context, Dai et al. (2012) conducted an empirical study that revealed that location awareness plays a significant role in increased customer' privacy concerns [2], but provides the consumer with the perceived value of being able to access needed information/services at the right time in the right place [13]. Junglas and Watson (2008) argued that LBS include two categories: location-tracking services and location-aware services. They found that location-tracking services are perceived to be more useful and easier to use than location-aware services, and generate higher efficiency [5].

Looney et al. (2004) defined ubiquity as the ability to communicate anytime, anywhere. They proposed that ubiquity significant influenced personal mobile IT acceptance. One of the most outstanding advantages of mobile technology is the ability to enable anytime, anywhere access, and the capabilties of ubiquity can affect intention to use behavior [7]. Yun et al. (2011) found that ubiquity positively influences attitude toward mobile web browsing services [15].

Reputation is defined as the degree to which consumers believe that the business vendor is honest and concerned about its customers [4]. Researchers have recognized that a firm's reputation is a valuable intangible asset that requires a long-term investment of resources, effort, and attention to customer relationships [11]. Creating a positive reputation is particularly important for those companies to be successful [8].

Trust is a salient factor of concern in the mobile environment. This is particularly true when mobile users use LBS and mobile commerce on their smartphones. The reason is that users may wonder whether LBS truly represent their interests or those of the vendors. Trust enables users to believe that LBS providers will bring favorable outcomes to them in the future. Kim et al. (2008) examined the determinants of customer acceptance of airline B2C e-commerce websites in terms of trust. Trust appeared to have a positive effect on the perceived usefulness, perceived ease of use, and intention to transact in electronic commerce [6]. Zhu et al. (2011) found that trust was a significant attitude factor in e-commerce. Hence, building trust is especially important for LBS vendors, as this will enhance users' attitudes and purchase intentions [14].

Entertainment is the ability of an LBS advertisement to promote enjoyment and create positive consumer attitudes by providing a form of escapism, diversion, aesthetic enjoyment, or emotional release. Richard and Meuli (2013) suggested that entertainment positively influences intention to use PBLAMA [10]. Bauer et al. (2005) found that entertainment and information are drivers of mobile marketing [1].

Therefore, the following hypotheses are developed to investigate the effects of LBS characteristics (location awareness, ubiquity, reputation, trust, and entertainment) on attitude toward LBS.

H1. Location-based service characteristics will have a positive effect on attitude.
H1a. Location awareness will have a positive effect on attitude.
H1b. Ubiquity will have a positive effect on attitude.
H1c. Reputation will have a positive effect on attitude.
H1d. Trust will have a positive effect on attitude.
H1e. Entertainment will have a positive effect on attitude.

According to Davis' (1989) TAM, the attitude towards using has a significant effect on the behavioral intention to use. The TAM describes a user's attitude, intention, and behavior toward IT [3]. Therefore, the following hypothesis is developed to investigate the effects of attitude on purchase intention for LBS.

H2. Attitude will have a positive effect on purchase intention.

III. Data Analysis and Results

The target population of this study was LBS users in South Korea, and a pilot test validated the survey instrument design using 50 LBS users in South Korea. Data for this study were collected from January 21 to March 20, 2014. The data were gathered from 231 questionnaire respondents with experience using LBS. Among these responses, 11 were excluded because of missing or inappropriate data. After removing the unsuitable questionnaires, a total of 220 surveys were considered for analysis. To test the proposed research model, data analyses for both measurement model and the structural model were performed using PLS. We used Smart PLS 2.0 with bootstrapping. Table Ⅰ shows the characteristics of the respondents, Table Ⅱ shows the convergent validity and reliability test, Table Ⅲ shows the discriminant validity test, and Table Ⅳ shows the summary of hypotheses testing.

TABLE I. CHARACTERISTICS OF THE RESPONDENTS

Classification		Frequency	Percentage (%)
Gender	Male	89	40.5
	Female	131	59.5
	Total	220	100.0
Age	20–25	98	44.5
	26–30	29	13.2
	31–35	27	12.3
	36–40	31	14.1
	41+	35	15.9
	Total	220	100.0
Education level	High school	32	14.5
	College/university	170	77.3
	Graduate school or above	18	8.2
	Total	220	100.0

Occupation	Student	94	42.7
	Office worker	47	21.3
	Technician	22	10.0
	Self-employed	12	5.5
	Education	16	7.3
	Others	29	13.2
	Total	220	100.0
LBS usage type (multiple response)	Map and location search	200	90.9
	Weather search	47	21.4
	Public transport search	110	50.0
	Social network services	151	68.6
	Information search based on activities of daily living	104	47.3
	Others	34	15.5

TABLE II. CONVERGENT VALIDITY AND RELIABILITY TEST

Variables	Item	Factor loading	AVE	CR	Cronbach 's α
Location awareness	LO1	.861	.762	.928	.896
	LO2	.916			
	LO3	.853			
	LO4	.861			
Ubiquity	UB1	.883	.827	.950	.896
	UB2	.944			
	UB3	.924			
	UB4	.884			
Reputation	RE1	.818	.756	.925	.891
	RE2	.921			
	RE3	.939			
	RE4	.789			
Trust	TR1	.780	.678	.894	.841
	TR2	.803			
	TR3	.855			
	TR4	.853			
Entertainmen	EN1	.783	.767	.908	.847
	EN2	.927			
	EN3	.910			
Attitude	AT1	.917	.864	.950	.921
	AT2	.953			
	AT3	.919			
Intention	IN1	.859	.807	.926	.880
	IN2	.911			
	IN3	.923			

TABLE III. DISCRIMINANT VALIDITY TEST

Variables	1	2	3	4	5	6	7
Location awarenes	**.873**[++]						
Ubiquity	.599	**.909**					
Reputation	.154	.050	**.869**				
Trust	.376	.243	.343	**.823**			
Entertainment	.381	.241	.184	.349	**.876**		
Attitude	.620	.499	.282	.521	.456	**.930**	
Intention	.494	.368	.193	.374	.586	.608	**.898**

[++] The values are presented on the diagonal of the square root of AVE

TABLE IV. SUMMARY HYPOTHESIS TESTING

Channel		Path Coefficient	*t* value	Result
H1a	Location awareness -> Attitude	.327	4.481***	Supported
H1b	Ubiquity -> Attitude	.157	2.144**	Supported
H1c	Reputation -> Attitude	.100	2.268**	Supported
H1d	Trust -> Attitude	.260	3.988***	Supported
H1e	Entertainment -> Attitude	.185	3.301***	Supported
H2	Attitude -> Purchase intention	.608	11.269***	Supported

Significance level: **: p<0.05 ***: p<0.01

IV. Conclusion

This study examined the effect of various characteristics of LBS on Korean users' attitude toward LBS and the effects of this attitude on purchase intention for LBS. To achieve the research objectives, an empirical study was conducted using 220 surveys in South Korea. The results of this study can be summarized as follows.

First, the results provide support for H1a, which predicted a positive relationship between location awareness and attitude. This suggests that LBS providers are aware of the exact location of the user, and then provide appropriate information to user, thus leading the user purchase products and services. This result is consistent with previous studies in which location awareness was found to be significantly related to attitude [5]. Second, the results provide support for H1b, which predicted a positive relationship between ubiquity and attitude. This suggests that LBS users with connect anywhere, anytime LBS will have improved purchase attitudes. This result is consistent with the finding of previous studies investigating factors influencing attitude and demonstrating significant relationships between ubiquity and attitude [7], [15]. Third, the results provide support for H1c, which predicted a positive relationship between reputation and attitude. This suggests that mobile buyers realize that they take a risk in making any mobile purchase because of the anonymous nature of mobile business. As such, LBS users are likely to emphasize the LBS provider's reputation to avoid various transaction-related risks and thus determine their trust in an LBS provider based on its reputation. Fourth, the results provide support for H1d and H1e, which predicted a positive relationship between trust and attitude and entertainment and attitude, respectively. These results are consistent with the findings of previous studies investigating factors influencing attitude and demonstrating significant relationships between trust/entertainment and attitude [10], [14]. Therefore, this study implies greater user purchase attitude is a critical factor for enhancing location awareness, ubiquity, reputation, trust, and entertainment.

Finally, the results provide support for H2, which predicted a positive relationship between attitude and purchase intention of LBS. This result is consistent with previous studies of the TAM in which purchase intention was found to be significantly related to attitude.

Like many empirical studies, this study has some limitations. First, in this study, the LBS users' purchase attitude factors affect only the LBS characteristics considered. In future research, there is need to consider other factors, user characteristics, and environmental characteristics. Second, the measurement items were obtained from previous research and

modified, and therefore there might have been some misspecification of the variables.

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