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WHAT IS THE MOBILE INTERNET FOR? A CROSS-NATIONAL STUDY ON THE VALUE STRUCTURE OF THE MOBILE INTERNET

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Abstract

As the mobile Internet has been used worldwide, cross-national differences of the mobile Internet have become an interesting issue. The objective of this study is to explore what values people were experiencing from using the mobile Internet and how the values were related to their satisfaction across different countries. To explore these differences, we propose a value structure, which is an analytic framework that consists of four different types of value components of the mobile Internet services. Based on the value structure, large-scale online surveys were conducted in Korea, Japan and Hong Kong simultaneously with the same questionnaire. Results show that value components of the mobile Internet were significantly different among the three countries. The relationships between the value structures and user satisfaction also varied across the three countries.

Keywords: Mobile Internet, cross-national study, value structure, user satisfaction

Introduction

Mobile Internet is defined as mobile access to wireless World Wide Web through handheld devices such as mobile phones and PDA (Francis 1997). Usage patterns of the mobile Internet vary across different countries (Pedersen, 2001). In Asian countries, for example, a mobile Internet-enabled phone has become recognized as a necessity in daily life (Kim et al. 2001). In North America, however, the mobile Internet is not as popular as in these Asian countries (ARC group 2001). In addition, popular mobile Internet services differ from country to country. For example, download service is the most popular one in Korea and Hong Kong, whereas email is the most popular in Japan (Kim et al. 2002). The differences of usage across different countries may be more substantial in the mobile Internet than in the traditional stationary Internet. This is because the wireless network can be accessed only by mobile devices, which are operated in the local area, while the stationary Internet can be accessed globally.

Numerous cultural factors might be related to the different usage patterns of the mobile Internet across different nations. However, this study primarily focuses on cross-national differences of values of mobile Internet users. This is because value is not only an important component of culture, but also it affects a user's behavior (Adler 1986, Pedersen, 2001). However, despite the importance of cultural differences in technologies (Straub et al. 2002), little research has been performed on the mobile Internet.

Therefore, this study aims to explore what are the values that people pursue by using the mobile Internet and how they are different across the countries. To perform cross-national study, three issues are considered carefully in this study. First, a reliable measurement of values across the countries was necessary. Therefore, we constructed an analytical framework of value and developed a valid measurement questionnaire. Second, it was difficult for individual researchers to collect empirical data from multiple nations in a systematic way. Therefore, we constituted a research consortium that administered online survey in different nations simultaneously with the same questionnaire. Finally, performance outputs that are related to values of mobile Internet were needed to provide practical implications. Therefore, we examined the relation between values and user satisfaction that is one of the representative measures of system success (Doll et al. 1994).

Three countries, Hong Kong, Japan, and Korea, were selected for this study. Regarding mobile Internet, these countries are considered as mature or advanced market because of early adoption of mobile Internet services and rapid increase in mobile

Internet users (ARC group 2001). Despite their geographical proximity, cultures of three countries are substantially different (Hofstede 1980), which enabled us to explicate the impacts of different cultures on the mobile Internet.

Theoretical Background

Culture and Value

There have been numerous efforts to identify human cultures and their cultural differences in many fields, ranging from anthropology to cross-cultural psychology (Hofstede 1980, Schwartz and Ros 1995). Despite the importance of culture, the effect of cultural factors on IS research areas has not received as much attention as needed because cultural studies always have confronted with difficulties of defining and measuring culture (Straub et al. 2002).

In general, culture is composed of many different sub-components such as value, norms and symbols (Straub et al. 2002, Hofstede 1980). Among the components of culture, this study focuses on value for two reasons. First, value has been regarded as a core concept in the definition of culture (Parsons and Shils 1951, Straub et al. 2002). Second, value is regarded as one of the influential factors that guided individual behavior (Parsons and Shils 1951, Adler Trompennaars and Hampden-Turner 1993). Therefore, to examine cross-national differences of mobile Internet, we focused on differences of values that mobile Internet users pursue across the countries.

Value Structure

Value becomes recognized as a key factor for not only understanding human behaviors, but also obtaining competitive advantage in business (Sheth et al. 1991, Sweeney 2001, Woodruff 1997). Value is defined as "consumer's overall assessment of the utility of a product or service based on perceptions of what is received and what is given" (Zeithaml 1988, p 14). By applying this definition to mobile Internet, we can define value of mobile Internet as a user's overall assessment of utility by using mobile Internet services.

As value has been of great interest in various areas, there have been many attempts to measure it (Cronin et al. 2000, Sweeney and Soutar 2001, Teas and Agrawal 2000). One of ways to measure value is regarding it as a set of heterogeneous multiple sub-components (Sweeney and Soutar 2001, Sheth et al 1991). For example, Sheth et al.(1991) argued that consumption value consists of multiple value components (i.e., functional value, conditional value, social value, emotional value, and epistemic value) that influence consumer's choice behavior. This view broadened the concept of value, which enables consideration of what values consumers could get from a product or services beyond the traditional monetary aspects of value (Bolton and Drew 1991, Monroe 1990).

Therefore, we propose the framework of value structure of the mobile Internet, which consists of four sub-components of values, based on prior research (Kim et al. 2001, Lee et al. 2002, Sheth et al. 1991, Cronin et al. 2000). The four sub-values are functional value, emotional value, social value, and monetary value.

First, functional value can be defined as practical or technical benefits that users can obtain by using the mobile Internet (Sweeney and Soutar 2001). For example, if a person in a bus wants to find a direction to an airport, he may experience the functional value by using a location-based local map service from the mobile Internet. Second, emotional value relates to mental or psychological needs of the mobile Internet users (Sweeney and Soutar 2001). For example, if one has fun by using a game service on the mobile Internet, he may fulfill his emotional needs. Third, social value means benefits that users have by feeling about how close they are connected to others through the mobile Internet (Sheth et al. 1991). For example, Korean youngsters who joined cyber communities via the mobile Internet enjoy their own culture and events in off-line as well as on-line. Finally, monetary value means the traditional cost-benefit value of the mobile Internet. It regards how much the mobile Internet services are satisfactory compared to the time and efforts spent in using the mobile Internet (Bolton and Drew 1991, Monroe 1990, Sweeney and Soutar 2001). Monetary value cannot be neglected since users have to pay high usage fees for using the mobile Internet services compared to the stationary Internet.

User Satisfaction

Measuring and understanding user's satisfaction is important from a practical standpoint, because it enables service providers to evaluate their current performance. There have been many attempts to measure the user satisfaction in IS research. For example,

user information satisfaction (UIS) was regarded as both objective effectiveness of a system and a subjective measure of system success (Doll et al. 1994). Also in marketing research, consumer satisfaction is a primary goal of providing products or services (Zeithaml, 1988).

In this study, we hypothesize that user satisfaction from the mobile Internet is closely related to the four value components that people obtain from mobile Internet services. Our hypothesis was based on numerous marketing literatures, in which the relationship of customers' value to satisfaction was identified (Spreng et al.,1996). In general, as mobile Internet users felt they obtain values, they may be satisfied with the mobile Internet services. However, which value components are more closely related to user satisfaction in the mobile Internet was not identified. Thus, we aimed to explore their relations in this study.

Cross-National Difference

We hypothesize that the four value components and their relations to user satisfaction may differ across different countries by the following reasons. First, value orientation, which means the way to perceive the relative importance of value components, has been found to differ across the countries. Hofstede (1980) measured value orientations of different countries by multiple dimensions, and found that people in different countries had different value orientations. For example, Japanese people have the highest level of individualism and the lowest level of collectivism among three countries in our study (Basabe et al. 2002). Therefore, people in different countries may have different value orientations and obtain different value components from similar mobile Internet services. For example, mobile Internet users in Japan might not appreciate the social value of the mobile Internet because of their high level of individualism.

Second, the current portfolios of available mobile Internet services may vary across different countries. Since mobile Internet services are more oriented to the local market, frequently used mobile Internet services are different across the countries. For example, Kim et al. (2002) found that download services were more popular in Korea, whereas news services were more prevalent in Hong Kong. People in one country might have higher functional value from the mobile Internet, because services that are geared to provide the functional value such as financial information are more prevalent in the country.

In summary, people in different countries might have different value components and different relations to their satisfaction because of not only their general value orientation but also currently available services. However, it is difficult to hypothesize a priori which components or relations are stronger in which countries because of lack of relevant studies. Therefore, we conducted an empirical study to explore these differences in the three countries. Our research hypotheses are presented as follows.

> *H1*: The value structures of the mobile Internet may vary across different countries.
> *H2*: The value structure may affect overall satisfaction from the mobile Internet.
> *H3*: The relation between each value component and user satisfaction may vary across different countries.

Research Methodology

Pilot Study

A pilot study was conducted to ensure consistency and soundness of measurement (Palvia 1996). The initial questions were developed based on literature surveys and adjusted to the mobile Internet usage. Preliminarily questions were tested based on discussions with mobile Internet experts, to ensure content validity. Then, questions were pilot tested in a paper-based survey with 103 undergraduate and graduate students in Korea who have used the mobile Internet services more than once in a month. As results, seven questions were dropped for not meeting the validity and reliability criteria. The remaining eleven questions were used in the main survey and a 7-point *Likert* scale was used.[1]

The final questionnaire was written in English to facilitate the communication among researchers in Korea, Japan and Hong Kong. To obtain language equivalence, the back-translation method was used (Warwick and Lininger 1975). The questionnaire was translated from each country's native language into English and vice versa by two independent translators separately. Any discrepancies among the translated questions were reconciled with discussions.

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[1]The questionnaire is shown in the appendix.

Data Collection

Large-scale on-line surveys were conducted simultaneously in Korea, Japan and Hong Kong with the same survey questionnaire in 2001. Respondents who used mobile Internet services were solicited via banner advertisement on the websites of several popular portals. As the results, 12,790 responses were responded in Korea, 3,166 in Japan and 5,807 in Hong Kong. To refine survey data, responses that contained answers with systematic errors and those with inconsistent demographic information were excluded.

Table 1. Demographic Information

Type	Korea		Japan		Hong Kong	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
Under 19	1226	2082	17	25	499	714
20-24	1534.00	2255.00	89	122	738	731
25-29	1297	281	331	339	716	483
30-39	652	274	624	689	685	330
Over 40	244	134	561	216	205	64
Total	4953	5026	1622	1391	2843	2322

The numbers of the final effective respondents were 10,379 in Korea, 3,013 in Japan and 5,165 in Hong Kong. Demographic profiles of the respondents in the three countries are shown in Table 1 below. Respondents were balanced in terms of gender in the three countries. However, the three countries were clearly different in terms of the age distribution of respondents. In Korea and Hong Kong, respondents were mostly in twenties, while most Japanese respondents were in their thirties and forties. However, no significant differences were observed across different age or gender groups in terms of value structure within a country. Thus, we merged all the data for further analysis.

Assessing Validity and Reliability

The questionnaire consisted of two main parts: questions about user satisfaction and value structures. Validities and reliability of the questionnaire were tested as follows. We first conducted explorative factor analyses by using SPSS version 11 with the varimax rotation method. The results are summarized in Table 2.

Questions were converged into their corresponding factors as expected. For example, the three questions for functional value (FV1, FV2, and FV3) were converged into a single factor across the three countries. The cumulative variances explained were high in all the three countries, 75.78%, 77.71%, and 80.80% in Korea, Japan, and Hong Kong, respectively. Moreover, the *Eigenvalues* of all the five factors, four value components and user satisfaction, exceeded 1.0 across the three countries.
Second, confirmative factor analysis for the four value components was conducted for both ensuring convergent and discriminant validities. We used LISREL 8.13 with the correlation matrix as inputs for ensuring construct validity. The fit indices and estimates generated by a structural equation modeling provided evidence of adequate models fit in the three countries as shown in Table 3.

The overall assessments are supported by the GFI, AGFI, and CFI, for which a minimum value of 0.9 is usually considered to be acceptable. For the RMSEA, all the values were under 0.08, which are usually considered to indicate reasonable model fit. Furthermore, an average variance extracted (AVE) approach was taken to test validity of the questions for the four value components. The results indicate that the four sub-constructs measured by the questionnaire met the validity in two aspects. First, all four average variance extracted (AVE) were greater than 0.5. Second, the AVEs in each measure exceeded the respective correlation estimates between factors across the three countries.

In addition, as shown in Table 1, *Cronbach Alphas* were calculated for reliability check and all the *Cronbach Alphas* exceeded 0.7 (Cronbach 1955). Therefore, by factor analyses and reliability check, our measurement for value structure obtained proper validities and reliability.

Table 2. Exploratory Factor Analysis Results

Type	Korea					Cron-bach Alpha	Japan					Cron-bach Alpha	Hong Kong					Cron-bach Alpha
	Factor						Factor						Factor					
	1	2	3	4	5		1	2	3	4	5		1	2	3	4	5	
FV1	0.12	0.07	0.81	0.14	0.21	0.89	0.24	0.02	0.10	0.77	0.17	0.87	0.17	0.10	0.34	0.76	0.14	0.90
FV2	0.13	0.25	0.78	0.20	0.19	0.89	0.14	0.30	0.26	0.74	0.10	0.86	0.07	0.38	0.06	0.75	0.01	0.90
FV2	0.11	0.42	0.66	0.02	0.03	0.89	-0.02	0.31	0.13	0.68	-0.03	0.87	0.19	0.25	0.40	0.72	0.14	0.90
EV1	0.10	0.18	0.30	-0.07	0.76	0.89	0.17	0.84	0.18	0.21	0.07	0.86	0.12	0.85	0.14	0.20	0.06	0.90
EV2	0.35	0.27	0.15	0.18	0.69	0.89	0.16	0.83	0.09	0.23	0.06	0.86	0.24	0.75	0.29	0.22	0.07	0.90
EV3	0.24	0.37	0.05	0.27	0.63	0.88	0.41	0.73	0.19	0.15	0.06	0.86	0.25	0.74	0.33	0.24	0.09	0.90
SV1	0.87	0.14	0.13	0.21	0.15	0.88	0.90	0.19	0.06	0.12	0.14	0.86	0.90	0.18	0.13	0.12	0.13	0.90
SV2	0.85	0.16	0.12	0.21	0.20	0.88	0.87	0.11	0.05	0.10	0.18	0.86	0.87	0.14	0.17	0.15	0.14	0.90
SV3	0.81	0.12	0.11	0.15	0.15	0.89	0.84	0.29	0.09	0.13	0.12	0.87	0.87	0.18	0.14	0.09	0.16	0.90
MV1	0.26	0.10	0.14	0.90	0.09	0.89	0.18	0.08	0.12	0.07	0.92	0.87	0.16	0.08	0.15	0.10	0.93	0.90
MV2	0.24	0.10	0.16	0.89	0.10	0.89	0.18	0.06	0.16	0.12	0.91	0.87	0.19	0.07	0.16	0.09	0.92	0.90
SAT1	0.14	0.77	0.23	-0.05	0.13	0.89	0.08	0.10	0.88	0.14	0.10	0.87	0.15	0.23	0.80	0.21	0.19	0.90
SAT2	0.15	0.77	0.15	0.17	0.30	0.89	0.06	0.06	0.85	0.16	0.14	0.87	0.11	0.17	0.80	0.26	0.19	0.90
SAT3	0.14	0.71	0.23	0.18	0.27	0.89	0.05	0.41	0.66	0.16	0.08		0.25	0.37	0.65	0.17	0.05	0.90
Eigenvalue	2.55	2.26	2.02	1.95	1.83	0.85	2.65	2.42	2.15	1.84	1.84	0.88	2.70	2.38	2.32	2.01	1.91	0.91
Cumulative % of variance	18.22	34.39	48.80	62.70	75.76		18.91	36.20	51.56	64.69	77.71		19.25	36.26	52.82	67.17	80.80	

Table 3. Confirmatory Factor Analysis Goodness of Fit Indices

Type	Korea	Japan	Hong Kong
Chi-square/d.f.	2054.37/38	733.59/38	575.64/38
Goodness of Fit Index (GIF)	0.95	0.96	0.97
Adjusted Goodness of Fit Index (AGFI)	0.91	0.93	0.95
Normed Fit Index (NFI)	0.96	0.97	0.98
Comparative Fit Index (CFI)	0.96	0.97	0.98
Non-Normed Fit Index (NNFI)	0.95	0.95	0.10
Root Mean Square Residual (RMR)	0.05	0.05	0.05
Root Mean Squre Error of (RMSEA)	0.07	0.08	0.05

Result

Comparison of Value Components

Average means and variances of the four value components were calculated by arithmetically averaging corresponding questions and then compared among Korea, Japan, and Hong Kong. These results are summarized in Table 4.

Table 4. Descriptive Statistics

Type	Korea		Japan		Hong Kong	
	Mean	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
FV	3.72	1.21	4.02	1.04	4.06	0.98
EV	3.50	1.30	3.97	1.24	4.34	1.02
SV	3.25	1.41	3.22	1.25	3.62	1.11
MV	2.57	1.42	2.93	1.31	3.35	1.21
Total	3.26	1.34	3.54	1.21	3.84	1.08

The overall average means of values of the mobile Internet were the highest in Hong Kong (3.842), followed by Japan (3.536) and Korea (3.264). All the four component values were also the highest in Hong Kong. Comparing between Japan and Korea, social value was higher in Korea than in Japan, whereas the other three values were higher in Japan than in Korea.

Regression Analysis Results

Regression analyses in the three countries were conducted to investigate the relationships between the four value components and user satisfaction of mobile Internet services. The average means of the four value components were used as independent variables and an average mean of the three user satisfaction questions (SAT1, SAT2, and SAT3) was used as a dependent variable. The results of three different regression models, one for each country, are shown in Table 5. Adjusted R-square confirmed the overall fits of each regression model. Adjusted R-squares were 0.471 in Korea, 0.392 in Japan, and 0.565 in Hong Kong, meeting the appropriate level for social science research (Choi, 1997).

From the results, we could see how closely the four value components were related to user satisfaction of the mobile Internet services. Moreover, the influences of value structures on overall satisfaction significantly differ in three countries. In Korea, the effect of functional value was the highest as the coefficient of 0.470, followed by emotional value (0.270). The relationship of satisfaction with social value (0.062), as well as that of monetary value (-0.050) was also found to be statistically significant even though their coefficients were marginal at most. In Japan, the functional value was also the highest as the coefficient of 0.483, followed by emotional value (0.207) and monetary value (0.106). However, the coefficient of the social value was negative (−0.132) and that of the monetary value was smaller (0.106) compared to other value components. In Hong Kong, the functional value was again the highest as the coefficients of 0.453, followed by emotional value (0.281), monetary value (0.109) and social value (0.047).

Table 5. Regression Analysis Results

Type	Korea			Japan			Hong Kong		
	Beta	**t-value**	**Sig.**	**Beta**	**t-value**	**Sig.**	**Beta**	**t-value**	**Sig.**
FV	0.47	50.43	0.00***	0.48	25.91	0.00***	0.45	34.31	0.00***
EV	0.27	26.09	0.00***	0.21	10.91	0.00***	0.28	21.34	0.00***
SV	0.06	6.56	0.00***	-0.13	-7.69	0.00***	0.05	4.19	0.00***
MV	-0.05	-5.80	0.00***	0.11	6.68	0.00***	0.11	10.60	0.00***
Adjusted R-square	0.47			0.40			0.57		
Error	0.73			0.76			0.66		

(*, $p<0.1$; **, $p<0.05$; ***, $p<0.01$)

Therefore, based on the regression analysis results, we could see that the relationship between value structures and user satisfaction of the mobile Internet were significant across the three countries.

Regression Coefficient Comparison

To compare the strength of relationships between the value components and user satisfaction among the three countries, the corresponding regression coefficients of value structures were compared among the three countries by an ANCOVA method. The SAS version 8.3 was used with the means of three countries as input variables. By comparing interaction terms of values by country, all the regression coefficients were significantly different across the three countries under the significant level of 0.001 as shown in Table 6. Post hoc analyses using a pairwise Tukey t test were conducted to identify which value components were different among the three countries. Functional value of Korean users differed from Japanese and Hong Kong users. Korean users were experiencing functional values lower than the other two countries. Social value of Hong Kong users differed from Korean and Japanese users. Hong Kong users were experiencing higher social value than Korean or Japanese users. Emotional and monetary values were different all among the three countries. In terms of emotional value, Hong Kong users experienced higher emotional value than Japanese users, who in turn got higher emotional value than Korean users. Finally, in terms of monetary value, Hong Kong users were again higher than Japanese users, and in turn Japanese users were higher than Korean users.

Table 6. ANCOVA Results

Type		Type III Sum of Squares	d.f.	Mean square	F-value	Sig.
Intercept	Hypothesis	5217.56	1.00	5217.56	1291.81	0.00***
	Error	159.50	39.50	4.04		
FV	Hypothesis	1757.86	18.00	97.67	98.52	0.00***
	Error	41.40	41.77	1.00		
EV	Hypothesis	448.62	19.00	23.61	29.31	0.00***
	Error	50.40	43.45	1.16		
SV	Hypothesis	11.07	19.00	0.58	0.30	0.98
	Error	80.28	40.75	1.97		
MV	Hypothesis	56.54	13.00	4.35	1.01	0.47
	Error	109.15	25.32	4.31		
Country*FV	Hypothesis	37.23	36.00	1.03	1.60	0.01***
	Error	11838.65	18352.00	0.65		
Country*EV	Hypothesis	45.40	36.00	1.26	1.96	0.00***
	Error	11838.65	18352.00	0.65		
Country*SV	Hypothesis	81.64	36.00	2.27	3.52	0.00***
	Error	11838.65	18352.00	0.65		
Country*MV	Hypothesis	122.34	24.00	5.10	7.90	0.00***
	Error	11838.65	18352.00	0.65		

(*, $p<0.1$; **, $p<0.05$; ***, $p<0.01$)

Discussion

The main results of this study are as follows: First, the value structures of the mobile Internet were different in Korea, Japan and Hong Kong. The average means of the four value components were highest in Hong Kong, followed by Japan, and finally Korea. This result means that Hong Kong users perceive higher values in using the mobile Internet services, which might be because of high density of population and heavy traffic in Hong Kong (Kim et al. 2002). Functional and monetary value was the lowest in Korea. The functional and monetary value of the mobile Internet was not perceived highly in Korea, maybe because of the marginal utility of the mobile Internet in addition to the traditional stationary Internet in Korea (Kim et al. 2002). The penetration rate of the stationary broadband Internet in Korea was higher than the other countries, which enabled Korean users to pervasively use more functions in much faster ways than the mobile Internet could provide. Therefore, the functional value that Korean users could get from the mobile Internet in addition to the versatile stationary broadband Internet might be very low. The monetary value of the mobile Internet was the lowest in Korea because of much higher connection fee of the mobile Internet compared to those of the stationary Internet. Korea had the lowest connection fee for the stationary Internet service among the OECD membership countries, and the price for the Mobile Internet was much higher compared to that of using stationary Internet in Korea. On the other hand, the social value was the lowest in Japan. Japanese users were not likely to use the mobile Internet to

satisfy their social value. This might be because of the high individualism of the Japanese (Hofstede 1980). Japan was ranked one of the highest countries in terms of individualism (46) compared to Hong Kong (25) and Korea (18) according to the recent studies on cross cultural score index (Basabe et al. 2002).

Second, the strength of the relationships between the four value components and the overall satisfaction of the mobile Internet were found to vary across the three countries. The coefficients of emotional value and monetary value on satisfaction were the highest in Hong Kong, which means these values might be more effective to increase the satisfaction of the mobile Internet users in Hong Kong than those in Japan or Korea. The effect of functional value of Japan users was higher than other countries. This might be because of the high masculinity score of Japanese people (95) compared to Korean (39) or Hong Kong (57) users (Basabe et al., 2002). The masculinity score indicated the value of performance, success, and competition, which are closely related to the functional value prevails over the culture. A recent survey asserted that the high score of masculinity drove Japanese users to prefer more utilitarian and instrumental mobile Internet contents compared to users in other countries (Kim, et al, 2002). Social value is more closely related to satisfaction in Korea, which may reflect the high value orientation toward collectivism in Korea, as well as high popularity of short message service (SMS) in Korea. A recent survey found that Korean users prefer to use the SMS service to other communication services (Kim et al, 2002).

This study includes several limitations as follows: First, although we verified that value structures differed across the three countries, different value structures may not be the only reason for the different usage of the mobile Internet among the countries. Second, this study investigated correlation between value structure and user satisfaction, but we could not explain why they were different across the three countries. Third, this study is limited to only Korea, Japan and Hong Kong and it is hard to generalize the results to other countries. Forth, the online-survey used in our study inherits problems such as self-selection and biased sampling problem (Piktow and Recker 1994;). Fifth, this study provides only a snapshot of the value structure of the mobile Internet. Finally, this study explored the mobile Internet as a whole and did not investigate more deeply into an individual service level, which is important to provide more concrete implications to mobile Internet service providers.

Despite these limitations, this study has some practical and theoretical implications. Theoretically this study first developed and empirically validated the metrics of the value structure for using the mobile Internet in three different countries. Since the four values were consistently applied to the three different countries, the value structure may have better chance to be used as a reliable tool to measure values of the mobile Internet users in other countries. Moreover, considering both importance and difficulties of cross-cultural studies in IS research, this study might offer insight to explain the different behaviors of the users in different countries or cultures not only in terms of mobile Internet but also in terms of related information appliances such as PDA and tablet PC.

In addition, this study provides practical implications that mobile Internet service providers need to focus on what users valued most when using the mobile Internet. The results show that service providers should differentiate the values by country, because effects of the value components on satisfaction differ significantly in the three countries. Since different values are more closely related to user satisfaction, service providers in each country need to verify what types of mobile Internet services provide what kinds of value components to their users. For example, service providers in Korea should provide more attention to mobile Internet services that provide high social value than those in Hong Kong. This is because the social value was most closely related to satisfaction of Korean mobile Internet users but current level of social value perceived by the Korean users was much less than Hong Kong users. Therefore, Korean service providers should investigate mobile Internet services that were currently available in Hong Kong and providing high level of social values to Hong Kong users. Another implication of the study may be applied to the adjustment of mobile Internet services to other countries. Fore example, NTT Docomo was trying to export their mobile Internet contents and services (I-mode) to different countries including Korea and Hong Kong. In their efforts to localize existing contents and services to target countries, the results of this study can be used as basic guidelines. For example, several features that may increase the social value can be added to existing services that are planned to be exported to the Korean mobile Internet market. Maximizing the user satisfaction through the optimization of value structure to the local mobile Internet users may improve the chance of the mobile Internet services to become the next killer application in the future.

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Appendix.   Survey Questionnaire Structure

Item code	Item description	Reference
FV1	The mobile Internet service is reliable.	Adapted from Sheth et al, 1991
FV2	The mobile Internet service has useful functions.	
FV3	The mobile Internet provides a timely service.	
EV1	Using the mobile Internet service is interesting.	
EV2	I enjoy using the mobile Internet service very much.	
EV3	I feel good when I use the mobile Internet.	
SV1	The mobile Internet helps me to be a part of close groups.	
SV2	The mobile Internet improves the way I am perceived to others.	
SV3	Using the mobile Internet gives me a sense of belongings to others.	
MV1	The mobile Internet offers value for money.	Adapted from Cronin et al, 2000
MV2	The mobile Internet is reasonably priced.	
SAT1	My choice to use the mobile Internet service was good.	
SAT2	I am satisfied with the mobile Internet services in general.	
SAT3	The mobile Internet services fill my needs.	

FV=functional value, EV=emotional value, SV=social value, MV=monetary value, SAT=satisfaction