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A STUDY ON THE ADOPTION OF CLOUD TECHNOLOGY SERVICE IN TOURISM

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ABSTRACT

Tourism is considered the "super star" industry with most growth potential in the 21st century. It is expected to bring huge economical benefits, and would be what countries in the world compete for. With the rapid development in technology, services provided by cloud technology have become increasingly diverse. One of the major areas for applying cloud service is to integrate it within travel industry to provide a value added service. Taiwanese government has been actively promoting local tourism. For example, the Taipei City Government utilizes cloud technology to promote itself as a smart city, using "MOTA (Map of Taipei Amusement)", a map based interactive guiding tool to deliver rich location based information. To understand how users take advantage of cloud technology, this study aims to construct a tourist cloud service accept behavior system (TCSAB) based on three elements, including innovation diffusion, the technology acceptance model, and media richness. Through an extensive literatures review, theories relevant to innovation service (i.e., reasoned action theory, innovation diffusion theory, and technology acceptance model), and to media richness (i.e. media richness theory, enjoyable experience) will be extracted in the TCSAB system. This study uses questionnaire to collect data. Structural Equation Modeling (SEM) is adopted to analyze the data to clarify the determinants influencing users' intention of tourist cloud service. Some implications from our results will be discussed and be expected as a reference for promoting the tourist industry in the future.

Keyword: cloud services, innovation diffusion, media richness, Structural Equation Modeling (SEM), tourist cloud service accept behavior (TCSAB)

LITERATURE REVIEW

Innovation Technology acceptance model

The MOTA system is an integrated technical service that applies the users for tourism information researching. The technology acceptance model (TAM) predicts consumers' acceptance of technical products or services. It was developed from the Theory of Reasoned Action (TRA) and was first proposed by Davis (1989). The TAM includes five constructs related to the use of technology, namely, perceived ease of use (PEOU), perceived usefulness (PU), attitude towards use (ATT), behavioral intention to use (BI), and actual behavior on use (AU). Among these, PU and PEOU are the most dominant determinants for system adoption. Furthermore, PEOU has a direct influence on PU. ATT directly influences a user's BI, which determines actual system adoption.

Innovation diffusion primarily focuses on exploring how business should develop and promote innovation to increase consumer intention to accept or adopt such innovations. As Meyer and Goes (1988) highlighted in their study, to understand, evaluate, use, adopt, and diffuse innovations are the necessary steps for diffusing innovations within an organization. IDT proposed by Rogers (1995) explains how individuals adopt new ideas or innovations.

Additional social influences: Social influence was defined as the social information that individuals received from innovation adoption by others. Peres, Muller and Mahajan (2010) pointed that social influences are transmitted to other individuals, who follow the consumption behavior of people in their aspiration groups. In particular, these influences are observed by potential adopters who infer from them the social consequences of adoption.

Due to the effectiveness of IDT in explaining innovation acceptance behavior (Alam, Ali & Jani, 2011), this study adopted the IDT as the theoretical base to propose a MOTA system for new tourism cloud technology.

H1: An individual's IN has a direct and positive impact on PEOU with respect to MOTA.

H2: An individual's PEOU has a direct and positive impact on PUB with respect to MOTA.

H3: An individual's PUB has a direct and positive impact on BI with respect to MOTA.

H4: An individual's PEOU has a direct and positive impact on BI with respect to MOTA.

H5: An individual's IN has a direct and positive impact on BI with respect to ACMS.

H6: An individual's SN has a direct and positive impact on BI with respect to MOTA.

RESEARCH DESIGN

Data collection

The development of MOTA is still in promotional process in Taiwan; thus, the users who realize this new technology and adopt it are limited. Therefore, individuals from the public over 3 years old with experience in using MOTA were selected as the sample in this study.

Through the convenience sampling method, 52 people were chosen and asked to fill out the questionnaire. After excluding missing or incomplete data, the final valid questionnaire responses were obtained from 52 users, 53.8 percent of whom were male and 50 percent were aged 21–25 , and 28.8 percent were aged 16–20. Most of the respondents had college education (82.7percent)

Measures of the constructs

Based on the TAM (Davis, 1989; Davis et al., 1989), IDT (Rogers,1995), ,and MRT(Daft and Lengel,1986)–this study selected 26 constructs as the basis to develop the integrated acceptance model for MOTA. These constructs were PEOU, PUB, IN, SN, MRT, PE and BI. Their definitions and measures (see Table 2) are as follows. PEOU was used to present the user's perceived ease of use of MOTA and was evaluated by four measures (i.e., PEOU1~PEOU4). PUB was used to present the user's perceived usefulness of and benefits from MOTA and was evaluated by six measures (i.e., PUB1~PUB6). SN was used to present the user's perceived MOTA and was evaluated by four measures (i.e., SN1~SN4).

IN was used to present the user's innovativeness with respect to MOTA and was evaluated by three measures (i.e., IN1~IN3). MRT was used to present the user's media information with respect to MOTA and was evaluated by four measures (i.e., MRT1~MRT4). PE was used to present the user's perceived enjoyment from MOTA and was evaluated by three measures (i.e., PE1~PE3). Finally, BI was used to present the user's behavioral intention to use MOTA and was evaluated by three measures (i.e., BI1~BI3). For each measure, a five-point Likert scale was adopted, where the scores 1 to 5 were equivalent to "extremely disagree," "disagree," "neither agree nor disagree," "agree," and "extremely agree," respectively.

Data analysis methods

First of all, the confirmatory factor analysis (CFA) was used to examine the validity and reliability of the measurement models, and next the structural equation modeling (SEM) was employed to interpret the structural model, making use of LISREL 8.12 as the instrument for data analysis. Each of the impact coefficients was estimated using the maximum likelihood method, while the model's overall fit used the following indicators: chi-square statistic/degrees of freedom ($\chi2/df$), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), parsimony goodness-of-fit index (PGFI), non-normalized fit index (NNFI), comparative fit index (CFI) and root mean square error of approximation (RMSEA)

RESULTS

Reliability and validity of the measurement model

This study used multiple items to present the latent constructs (i.e., PEOU, PUB, IN, SN, MRT, PE and BI) using a structured questionnaire. First, most of the goodness-of-fit indices suggested that the measurement model was a good fit to the data (see Table 1). Each latent construct was then tested for internal consistency using Cronbach's α and construct reliability. As shown in Table 2, the coefficients α ranged from 0.68 to 0.88, while the construct reliabilities ranged from 0.65 to 0.88. These indicated a higher internal consistency of measurement indicators; hence, the reliability of each construct was ensured (Nunnally, 1978; Bagozzi and Yi, 1988).

The convergent validity and discriminant validity were then assessed. Convergent validity is supported if the standardized factor loadings of the items on latent constructs are above 0.50 or are statistically significant (Bagozzi and Yi, 1988). In Table 2, the standardized factor loadings ranged from 0.60 to 0.86 and were statistically significant at $p<0.05$. Therefore, the convergent validity of the measurement indicators was supported. Discriminant validity test was performed to establish the distinction among the constructs used in this study. Thus, this study followed the method suggested by Hair et al. (2006) by pairing these two latent constructs and subjecting them to the two models of CFA. The first model allowed the correlation between the two constructs to be estimated (unconstrained), while in the other model, the correlation between the two constructs was set to 1 (constrained). The chi-square difference test was then used to compare the first model with the second model. The results indicated that all of the chi-square difference values were statistically significant at $p<0.05$. Hence, the discriminant validity was supported.

Table1 Fit indices for measurement and structural model

Fit indices	Recommended value	Measurement model	Structural model
$\chi^2/d.f.$	≤ 3	1.34	1.49
GFI	≥ 0.9	0.64	0.61
AGFI	≥ 0.8	0.55	0.52
PGFI	≥ 0.5	0.51	0.50
NNFI	≥ 0.9	0.88	0.86
CFI	≥ 0.9	0.90	0.88
RMSEA	≤ 0.1	0.08	0.098

Table2 the results of CFA for measurement model (*N*=52)

Latent construct and items	Standardized factor loading	Construct reliability	Cronbach' α
Easy to use (PEOU)			
PEOU1: I think that the way using MOTA simple	0.81*	0.88	0.88
PEOU2: I think that the way using MOTA easily understandable and clear	0.79*		
PEOU3: I think that the way using MOTA easy to learn	0.86*		
PEOU4: As a whole, I think that the way using MOTA convenient to use	0.74*		
Perceived usefulness/benefit (PUB)			
PUB1:I think using MOTA can receive tourism information	0.65*	0.85	0.84
PUB2: I think using MOTA can prove tourism quality	0.63*		
PUB3: As a whole, I think MOTA is useful	0.75*		
PUB4: I think MOTA provide more information than others	0.71*		
PUB5: I think using MOTA is easier than others	0.80*		

Latent construct and items	Standardized factor loading	Construct reliability	Cronbach' α
PUB6:I think using MOTA is better than other for understanding Taipei city	0.60*		
(SN)			
SN1: relatives would recommend for using MOTA	0.71*	0.75	0.86
SN2: family would recommend for using MOTA	0.80*		
SN3: friend would recommend for using MOTA	0.60*		
(MRT)			
MRT1:MOTA gives custom using experience	0.65*	0.80	0.79
MRT2:MOTA provide a variety of travel information	0.79*		
MRT3: MOTA present travel information by variety ways	0.77*		
MRT4:I can get the information I need by using MOTA	0.60*		
PE			
PE1:using MOTA is a pleasure	0.80*	0.86	0.85
PE2:using MOTA is interesting	0.88*		
PE3: using MOTA maintain a good mood	0.78*		
Personal innovativeness (IN)			
IN1: I'm the first to try new technology among the surrounding people.	0.35*	0.65	0.68
IN2: I like to try new technology.	0.89*		
IN3: I'm open to new ideas.	0.57*		
Behavioral Intention (BI)			
BI1: If necessary, I would make use of MOTA often	0.62*	0.76	0.82
BI2: When I need, I am willing to use MOTA	0.85*		
BI3: As a whole, I am highly willing to use MOTA	0.68*		

Note: *: $p < 0.05$.

Structural model

The SEM technique was used to interpret the unified model (as illustrated in Figure 3). According to the analyzed results (see Table1), the overall fit indices of the model were all found to be within the acceptable scope, suggesting that the model was a good fit to the data.

It is obvious that there are only eight hypotheses that can be supported (see Table 3 and Figure 4): IN has a significantly positive impact on PEOU (λ = 0.71*); PEOU has a significantly positive impact on PUB (λ = 0.77*); PUB has a significantly positive impact on BI (λ = 0.42*); PEOU has a non-significant impact on BI (λ = 0.05); PI has a non-significant impact on BI(λ = -0.52); SN has a non-significant impact on BI (λ = 0.17);MRT has a non-significant impact on BI (λ = 0.12); and PE has a significantly Vpositive impact on BI (λ = 0.81*) In addition, the R^2 value of the unified model is 0.73 (> 0.5), showing that the unified model has good explanatory power.

Table3 summarizes the results of standard path coefficient for each hypothesis.

Hypothesis	Standard Path coefficient	Decision
H1:PI->PEOU	0.71*	Supported
H2:PEOU->PUB	0.77*	Supported
H3:PUB->BI	0.42*	Supported
H4:PEOU->BI	0.05(ns)	Not Supported
H5:PI->BI	-0.52(ns)	Not Supported
H6:SN->BI	0.17(ns)	Not Supported
H7:MRT->BI	0.12(ns)	Not Supported
H8:PE->BI	0.81*	Supported

Note: *: $p < 0.1$, **: $p < 0.05$, and ns: non-significant.

Furthermore, we analyzed the total effects of the factors on BI. The results indicated that the most critical factor that affects BI of MOTA is PE (0.81), followed by PUB (0.42), SN (0.17), MRT(0.12),PEOU (0.05) and PI(-0.52). Likewise, the effects of the other factors on BI are non-significant at $p < 0.05$.

Figure3 Proposed research model for tourist cloud service accept behavior system

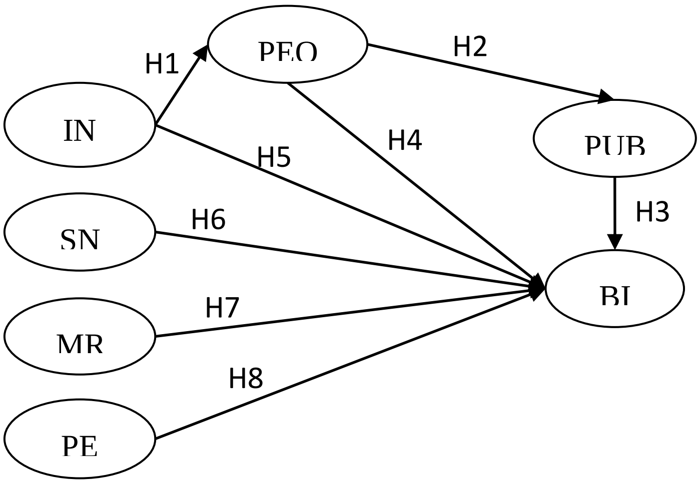

Figure4 MOTA for tourist cloud service accept behavior system