Measuring the Effect of Smart Tourism Technology on Travelers' Perceived Value, Use Intention, and Overall Tourism Destination Satisfaction

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Abstract. During the developments of smart cities' technologies and "5G+" technology, various smart tourism technologies were intensively developing and upgrading. But before a trip, what factors could affect travelers' use intention and travelers' perceived value placed on smart tourism technology? What factors could influence a traveler's feelings of overall tourism destination satisfaction? Little literature focuses on this interesting and value question and inquiry regarding motivation. Therefore, this research was constructed. A quantitative analysis was carried out using a questionnaire. The Yunnan mobile tour application was chosen as the research case. After analyzing the research data, relative advantage, compatibility, and observability could all positively affect travelers' use intentions of smart tourism technology. Observability and travelers' use intention could both positively affect travelers' perceived value of smart tourism technology. Travelers' use intention and travelers' perceived value could both positively affect overall tourism destination satisfaction with smart tourism technology. The research results and conclusions provided some insights for authors who are interested in this theme, and also provided some suggestions for the providers of smart tourism technology.

Keywords: Smart tourism technology · Travelers' perceived value · Travelers' use intention · Overall tourism destination satisfaction

1 Introduction

During the development of information and communication technology, the internet, 5G technology, and various smart tourism technologies (STTs) have actively appeared and developed in the platform of smart cities and smart tourism destinations [1, 2]. These STTs have not only brought new opportunities for the development of tourism and the hospitality industry, but have also strengthened the overall competitiveness of tourism destinations. At the same time, the STTs have provided tourists with a lot of help and convenience in the whole process of traveling [3, 4]. However, why do some travelers

V. Balakrishnan et al. (Eds.): ICMEIM 2022, AHSSEH 6, pp. 848–856, 2022.
https://doi.org/10.2991/978-94-6463-044-2_106

not use some STTs before a trip? How do the STTs affect overall tourism destination satisfaction from the travelers' point of view? Little literature has focused on these valuable issues and situations. Therefore, based on these motivations and problems, this study was established and constructed to measure the effect of STTs on travelers' perceived value, travelers' use intention, and overall tourism destination satisfaction. This study seeks to answer three research questions. First, what factors will affect travelers' use intention for the STT? Second, what factors will influence travelers' perceived value of the STT? Finally, what were the relationships between travelers' use intention, travelers' perceived value, and overall tourism destination satisfaction?

2 Literature Review

2.1 Smart Tourism Technology

Many authors indicated that the concept of smart tourism originally generated in the 1990s [5]. Some scholars pointed out the definition of smart tourism and explained that it means that travelers could ubiquitously obtain travelling information or relevant services during the whole process of traveling [6]. Dorcic, Komsic and Markovic [7] indicated that STT refers to a mobile information system, the STTs were loaded on many smart mobile devices, but also commonly exhibited the digital environment of tourism to create some valuable and meaningful experiences for tourists. The STTs usually include cloud computing, ubiquitous internet technology, near-field communication technology, radio frequency identification technology, virtual reality technology, augmented reality technology, and mobile phone applications [8, 9]. This research chose the Yunnan mobile tour application as a research case that came from a type of mobile phone application.

2.2 Diffusion of Innovation Model

Some authors presented that the DOI diffusion meant that behavioral processes were a new thing or idea that was accepted, used, or applied [10]. While DOI was primarily a communication or sociological theory used to explore patterns of adoption, it could also be used to test whether and how a new innovative technology will be successful [11, 12]. From the levels of analysis and perspectives, DOI studies can be categorized into two levels that include organizational level research and individual level research; the individual level adoption process included the pre-adoption stage and the adoption decision stage in the DOI model [13]. Therefore, the DOI model was suitable for this research. Some scholars have shown that, with perceived benefit as part of the variable of relative advantage, it would also positively affect the variable of perceived value [14]. Additionally, some researchers have determined that compatibility positively affects users' adoption of smart retail technology and can indirectly impact their shopping, perceived value, and adoption [15]. Moreover, a study on the e-wallet service functions in medium-sized companies showed that the variable of observability positively affects customers' use intention for e-wallet services [16]. Some authors have used the DOI model to study tourists' use intention for the Malaysian smart tourism application (Moh Poie Rembau, MPR). During the data analysis, the authors found that relative advantage,

ease of use (the opposite of complexity), compatibility, and trialability can all positively affect tourists' use intention toward MPR [17]. Rogers [18] defined trialability as the degree to which an innovation may be experimented with on a limited time or resource's limitation before adoption. The Yunnan mobile tour application was a research case regarding STTs. It has been published for many years, so the application's platform has passed the trial period. Thus, trialability was not included in the research model. Excluding trialability is not a unique instance to our study.

According to previous literature reviews, the present study will establish the following research hypotheses:

Hypothesis 1 (H1): Relative advantage has a positive association with travelers' use intention regarding STT.

Hypothesis 2 (H2): Relative advantage has a positive association with travelers' perceived value of STT.

Hypothesis 3 (H3): Compatibility has a positive association with travelers' use intention toward STT.

Hypothesis 4 (H4): Compatibility has a positive association with travelers' perceived value of STT.

Hypothesis 5 (H5): Complexity has a negative association with travelers' use intention toward STT.

Hypothesis 6 (H6): Complexity has a negative association with travelers' perceived value of STT.

Hypothesis 7 (H7): Observability has a positive association with travelers' use intention toward STT.

Hypothesis 8 (H8): Observability has a positive association with travelers' perceived value of STT.

2.3 Travelers' Perceived Value, Use Intention, and Overall Tourism Destination Satisfaction

Some study clearly indicated that customers' use behaviors impacted their perceived value toward various innovative technologies [19]. In addition, many researchers discovered that travelers' use intention could positively influence their perceived value, and their perceived value and use intentions both positively affect overall tourism destination satisfaction toward the Macau ubiquitous internet technology [20]. Based on previous research, the current study proposed further hypotheses:

Hypothesis 9 (H9): There was a positive relationship between travelers' use intention and travelers' perceived value for STT.

Hypothesis 10 (H10): There was a positive relationship between travelers' use intentions and overall tourism destination satisfaction toward STT.

Hypothesis 11 (H11): There was a positive relationship between travelers' perceived value and overall tourism destination satisfaction toward STT.

3 Research Methodology

To verify the research hypotheses, the Yunnan mobile tour application was chosen as the research case. The quantitative analysis was carried out using a questionnaire that included items from previous literature. The questionnaires were distributed from January 2022 to February 2022. Out of the 420 questionnaires that were collected, 380 were valid. Convenience sampling and judgment sampling were chosen as the sampling methods for this study. The data were analyzed using SPSS 23 and Smart PLS 3.

4 Results

4.1 Research Reliability and Validity Analysis

As shown in Table 1, each variable's Cronbach's alpha and composition reliability were both higher than 0.7 [21, 22]. Therefore, this research's reliability was accepted.

Table 2 shows that the factor loading coefficient of each item was more than 0.7 for each variable. The average variance extracted (AVE) of each variable was higher than 0.5, so convergent validity was accepted [23, 24]. Table 3 shows the results of the discriminant validity analysis (Notes: CA = compatibility; CO = complexity; OB = observability; OS = Overall Tourism Destination Satisfaction; PV = Perceived Value; RA = relative advantage; UI = use intention.). The square root of the AVE for each variable was higher than any of the intercorrelations of the constructs; thus, the seven variables had higher discriminant validities [25, 26]. Therefore, according to the results of convergent validity and discriminant validity, this research validity was acceptable.

4.2 Research Hypotheses

After the bootstrapping procedure of Smart PLS 3, each variable's relationships were obtained. Table 4 showed each variable's direct relationships in this research.

Table 1. Each variable Cronbach's alpha value and composite reliability value.

Variable	Cronbach's Alpha	Composite Reliability
Relative Advantage	0.870	0.920
Compatibility	0.890	0.932
Complexity	0.933	0.943
Observability	0.899	0.937
Use Intention	0.944	0.960
Perceived Value	0.923	0.951
Overall Tourism Destination Satisfaction	0.933	0.957

Table 2. Each item factor loading coefficient and each variable AVE value.

Variable	Item	Factor Loading Coefficient	AVE
Relative Advantage	Relative Advantage 1	0.873	0.794
	Relative Advantage 2	0.894	
	Relative Advantage 3	0.905	
Compatibility	Compatibility 1	0.898	0.819
	Compatibility 2	0.908	
	Compatibility 3	0.910	
Complexity	Complexity 1	0.804	0.804
	Complexity 2	0.918	
	Complexity 3	0.930	
	Complexity 4	0.929	
Observability	Observability 1	0.924	0.831
	Observability 2	0.899	
	Observability 3	0.912	
Use Intention	Use Intention 1	0.935	0.856
	Use Intention 2	0.918	
	Use Intention 3	0.924	
	Use Intention 4	0.925	
Perceived Value	Perceived Value 1	0.932	0.867
	Perceived Value 2	0.934	
	Perceived Value 3	0.928	
Overall Tourism Destination Satisfaction	Overall Tourism Destination Satisfaction 1	0.939	0.882
	Overall Tourism Destination Satisfaction 2	0.942	
	Overall Tourism Destination Satisfaction 3	0.937	

Some researchers indicated that, if the P value was less than 0.05 ($T > 1.96$, confidence interval did not include zero), the path coefficient was significant (*), and the path was supported; if the P value was less than 0.01 ($T > 2.58$, confidence interval did not include zero), the path coefficient was more significant (**), and the path was supported; if the P value was less than 0.001 ($T > 3.29$, confidence interval did not include zero), the path coefficient was most significant (***), and the path was supported; and if the P value was more than 0.05 ($T < 1.96$, confidence interval included zero), the path coefficient was not significant, and the path was not supported [27, 28].

Table 3. Discriminant Validity Analysis Results (Fornell-Larcker Criteria).

	CA	CO	OB	OS	PV	RA	UI
CA	0.905						
CO	0.188	0.897					
OB	0.553	0.248	0.912				
OS	0.471	0.065	0.456	0.939			
PV	0.509	0.076	0.555	0.769	0.931		
RA	0.741	0.112	0.483	0.431	0.492	0.891	
UI	0.521	0.070	0.479	0.843	0.818	0.486	0.925

Table 4. Each variable's direct relationships.

Path	Path Coefficient (β)	T Value	P Value	Confidence Intervals	
				2.5%	97.5%
Relative Advantage -> Use Intention	0.172	2.232	0.026	0.015	0.314
Relative Advantage -> Perceived Value	0.065	1.436	0.151	-0.026	0.151
Compatibility -> Use Intention	0.256	2.997	0.003	0.105	0.439
Compatibility -> Perceived Value	-0.008	0.179	0.858	-0.096	0.086
Complexity -> Use Intention	-0.064	0.935	0.350	-0.212	0.072
Complexity -> Perceived Value	-0.028	0.805	0.421	-0.105	0.036
Observability -> Use Intention	0.270	4.433	0.000	0.148	0.384
Observability -> Perceived Value	0.202	4.906	0.000	0.121	0.284
Use Intention -> Perceived Value	0.696	17.859	0.000	0.617	0.767
Use Intention -> Overall Tourism Destination Satisfaction	0.648	10.483	0.000	0.528	0.769
Perceived Value -> Overall Tourism Destination Satisfaction	0.238	3.478	0.001	0.103	0.370

According to the directly influential relationships of each variable in Table 4. The research proved that H1, H3, H7, H8, H9, H10, and H11 were supported, but H2, H4, H5, and H6 were not supported. After that, according to the hypotheses' supported results, this research designed the final structural model that appears in Fig. 1. In Fig. 1, the real lines meant that the paths were supported, the dotted lines meant that the paths were not supported.

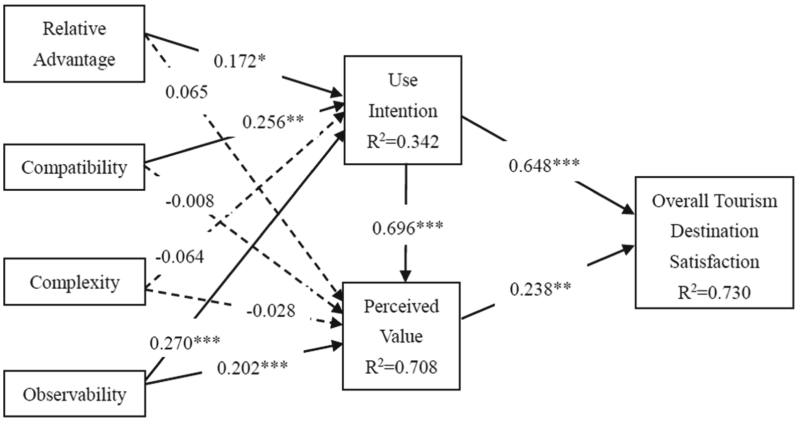

Fig. 1. The final structural model.

5 Conclusion and Implications

In order to complete the research questions, objectives, and topic, some conclusions would be summarized based on the previously relevant results. For the travelers' use intention, relative advantage, compatibility and observability could all positively affect travelers' use intention toward STT. The effect of observability was highest for travelers' STT use intention; For the travelers' perceived value, observability and travelers' use intention could both positively affect travelers' perceived value in STT's background. The effect of travelers' use intention was highest for travelers' perceived value; For overall tourism destination satisfaction, travelers' use intention and travelers' perceived value could both positively impact overall tourism destination satisfaction toward STT. The effect of travelers' use intention was highest for overall tourism destination satisfaction.

There were theoretical contributions from this work, as this research revealed the relationships between relative advantage, compatibility, observability, complexity, travelers' perceived value, travelers' use intention, and overall tourism destination satisfaction. These research results and conclusions provided some insights and references for some authors who are interested in this theme or relevant topics. For actual contributions, the research results and conclusions can contribute some actual suggestions and references to the providers of STT, especially the providers of the Yunnan mobile tour application. For example, the research results and conclusions can provide some references to improve and design the STTs' functions, such as enhancing the quality or efficiency of STT, focusing on travelers' habits or preferences for STT, or increasing more STTs' communicative exhibitions. Additionally, the research results and conclusions also could promote the delivery of local ethnic culture via STTs.

This research has some limitations. First, the Yunnan mobile tour application was chosen as the research case. Second, the research sample mainly focused on Dali, Lijiang, and Kunming in Yunnan province. The research sample mainly focused on young people. Finally, this study was based on the five variables of DOI, travelers' perceived value, travelers' use intentions, and overall tourism destination satisfaction to construct the research model.

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