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Introduction

Advanced digital technology has been reshaping the way customers plan for their trips and search for the destination information nowadays. Customers do not have any spatial and temporal restrictions to experience their potential tourism destinations prior to actual visit. Various types of intelligence technologies (i.e., augmented reality and virtual reality) have transformed the traditional ways people travel to and experience in a tourism destination. Through the digitally-accommodated environment, both augmented reality (AR) and virtual reality (VR) allow customers to experience products, services, or places before they purchase (Chung, Han, & Joun, 2015; Tussyadiah, Wang, Jung, & Dieck, 2018). In particular, VR is an interactive computer-generated experience that takes place within a simulated environment but offers a real-world feeling, requiring participants' active engagement in all features available in the given settings.

VR is one of the most innovative technologies that makes customers immerse in a real destination through necessary virtual reality equipment such as VR headsets. Immersing in their future travel destination, customers can realistically portray their future travel activities and make feasible travel plans accordingly. Dependent upon whether the virtual destination is met to offer their expected travel activities, customers can mindfully be ready to make a booking decision or look for better options that satisfy their upcoming travel needs. VR can be a great marketing tool for tourism destinations by generating more traffic and drawing customers' attention to the destination. However, it would be critical and important for VR developers or industry practitioners to answer whether VR carries quality features that satisfy users' expectations at the same time whether it fulfills customers' virtual desires by being fully immersed in the place for their future trips.

Despite the industry's skyrocketing adoption of VR for customer engagement and its marketing efforts, research in VR's roles, its quality assessment, and users' psychological acceptance of VR in the tourism context is still at its infancy. Identifying and responding to issues related to VR, this study attempted to (1) examine customers' perceived importance of VR as a promotional marketing platform for their travel destination selection, (2) evaluate VR by the pre-defined quality measurements for developing realistic and experiential VR from the customer perspectives, (3) assess customers' behavior intentions to use VR for their travel planning tool, and (4) develop a quality-driven VR framework to increase the adoption of VR by both customers and industry.

Literature Review

VR as a destination marketing tool

Tourism marketers are developing innovative ways to promote a destination image and increase customers' travel intentions (Baker & Cameron, 2008). VR allows customers to have a personalized experience without any physical or financial risk (Spielmann & Mantonakis, 2018). From customers' point of view, benefits of using VR include enhancement of tourism experiences (Bonetti, Warnaby, & Quinn, 2018) through a facilitation of immersive, engaging virtual environment (Jung, Lee, Chung, & tom Dieck, 2018). Based on prior VR research, this study investigates the role of content quality, system quality, and vividness of VR on customers' attitudinal and behavioral responses in the context of the destination marketing.

Content quality refers to the quality of the information provided by VR. It explains content accuracy, completeness, and content presentation format (Nelson, Todd, & Wixom, 2005). DeLone and McLean (2003) emphasized the importance and relevance of content quality in the information system success research. Content quality has been emphasized in various technological applications. Jung, Chung, and Leue (2015) investigated the importance of content quality in the context of augmented reality technology and Lai (2015) identified the importance of content quality in the context of app-based mobile tour guides. Based on the prior research that identified the positive effects of content quality in different technological contexts, it is predicted that when customers perceive content quality in VR, they develop favorable responses toward the VR and the destination. Thus, the following hypotheses are proposed.

H1: Content quality of VR positively influences customers' attitudes toward the VR.
H2: Content quality of VR positively influences telepresence.

System quality refers to "a system wherein the desired characteristics of both mobile devices and web browsing services are believed to be available to users" (Chen, 2013, p. 27). System quality explains reliability, convenience of access, response time, and system flexibility (DeLone & McLean, 2003). The importance of system quality has been confirmed in previous research (DeLone & McLean, 2003; Jung et al., 2015). System quality has been emphasized in various technological application, including mobile broadband services (Wang & Chen, 2011), mobile shopping (Chen, 2013), and augmented reality (Jung et al., 2015). For instance, Wang and Chen (2011) investigated customers' perception of mobile broadband services, derived from DeLone and McLean's (2003) information system success model. They identified the direct and positive influence of system quality on customers' satisfaction and their intention to use. System quality plays an important role influencing customers' responses (Jung et al., 2015). Jung et al. (2015) identified the importance of system quality on customers' satisfaction and loyalty when they interact with the augmented reality technologies, based on DeLone and McLean's Model. System quality also enhances customers' experiences, enabling them to feel be there. For instance, Kim and Hyun (2016) explained relationships among system quality, information quality, service quality, telepresence, and augmented reality reuse intention, based on the Technology Acceptance Model. Thus, the following hypotheses are proposed.

H3: System quality of VR positively influences customers' attitudes toward the VR.
H4: System quality of VR positively influences telepresence.

Vividness refers to "the representational richness of a mediated environment as defined by its formal features; that is, the way in which an environment presents information to the senses" (Steuer, 1992, p. 81). Vividness is enhanced by enriching depth and breadth. Depth explains the quality of the represented information as perceived by media users and breath refers to the number of sensory dimensions a communication medium can provide (Li, Daugherty, & Biocca, 2002). In the context of e-commerce, vividness is related to the quality of product presentations since customers' cognitive elaboration processes are stimulated with vivid product descriptions (Jiang & Benbasat, 2007). For instance, rich media that include video, audio, and animation tend to increase vividness on the destination's website. When a website is described as vivid, customers tend to develop favorable attitudes toward the product (Coyle & Thorson, 2001). Vividness also contributes to customers' perception of telepresence (Steuer, 1992). Yim,

Chu, and Sauer (2017) identified the importance of vividness in the augmented reality technology in enhancing customers' immersion experience in the context of e-commerce. When destination information is described in a rich manner, a high level of telepresence is expected. Thus, the following hypotheses are proposed.

H5: Vividness of VR positively influences customers' attitudes toward the VR.
H6: Vividness of VR positively influences telepresence.

Outcomes of customers' VR experience

VR research identifies customers' VR experience leads to customers' positive outcomes, such as enriched experiences (Yim et al., 2017), brand recognition (Kim & Biocca, 1997), favorable attitude (Chung et al., 2015), satisfaction (Jung et al., 2015), and behavioral intentions (Huang et al., 2013). Attitude toward the VR refers to "a pre-disposition to respond in a favorable or unfavorable manner to stimulus" on the VR (Lutz, 1985, p. 46). Attitudes toward the VR is viewed as important predictors of customers' behavioral intentions, which refers to customers' likelihood to visit the destination. Ajzen's (1991) theory of planned behavior advocates the importance of intentions that can lead to the actual behaviors. Chung et al (2015) emphasizes the importance of customers' behavioral intention that can result in the success of the destination marketing. Thus, the following hypothesis is proposed.

H7: Customers' attitudes toward the VR positively influence their behavioral intention to visit the destination.

VR is viewed as a powerful tourism marketing tool because VR is able to offer vivid imagery of tourism destinations to potential tourists (Huang et al., 2016). VR provides the immersive experience to customers. Immersive experience explains telepresence, which refers to "the sense of being present in the remote environment" (Steuer, 1992, p. 75). Telepresence plays a critical role in the tourism industry because customers have limited access to evaluate their future travel experience before they visit the destination. Travel's intangible components cannot be evaluated until customers actually experience them; thus, inherent risks of the tourism experiences are higher than the tangible products (Nelson, 1970). Customers could be virtually transported to and immersed in the destination due to the interactive and immersive characteristics of VR experiences (Spielmann, & Mantonakis, 2018). Prior research identified the positive relationship between telepresence and behavioral intention (Lee, 2018). She identified the importance of telepresence in enhancing hotel customers' visit intentions.

H8: Telepresence positively influence customers' behavioral intention to visit the destination.

Methodology

An online self-administered survey was performed, hosted on Qualtrics, by using a convenient sampling method. A convenience sample of 247 U.S. adult consumers who have used virtual reality, was obtained from an online survey company. The survey has three sections: the first section contains items related to customers' familiarity with destination (i.e., Santa Clara in California) and advanced technology; the second section asks questions on seven measurement constructs of the study; and, the last section asks questions related to respondents' socio-

demographic information. All measurement constructs are operationalized with multi-items on a 5-point Likert-type scale (from 1: strongly disagree to 5: strongly agree), except for the attitude construct (a 5-point semantic differential scale). In order to test customers' VR experience, this study used the VR of Santa Clara, considering Santa Clara was their future travel destination, https://xplorit.com/santa-clara-california. Prior to answering the survey, respondents were required to visit and experience this virtual tour of Santa Clara at least five minutes. Before conducting the online survey with survey participants, a pilot test with students majoring in hospitality and tourism management at three midwestern, southeastern, and southern universities in the U.S. and expert reviews with three hospitality researchers were conducted. Table 1 summarizes the measurement items.

Results

A descriptive analysis was conducted to identify the characteristics of the respondents' socio-demographic profile. For both the measurement and the structural model analyses, this study conducted partial least squares SEM (PLS-SEM) analyses in light of the fact that the PLS-SEM approach can be used to develop theories further by focusing on the variance in the dependent variables in exploratory research (Hair et al., 2017). Moreover, this approach mainly focuses on sophisticated models in order to predict key target constructs or to perform theory testing (Hair et al., 2018).

Characteristics of the sample

A total of 247 usable responses were obtained to test structural relationships. The majority of respondents were between 26 and 34 years old (24.7%) and males (51.4%). More than a half of them (56.3%) reported to earn more than $50,000 annual household income. In terms of the previous travel experience in Santa Clara, CA, approximately 34% of participants have been to Santa Clara before and they do not seem very familiar with Santa Clara (average of familiarity of Santa Clara = 2.8 out of 5.0).

Measurement model test

This study first checked the measurement model by eliminating the measured variables or latent factors that did not fit well, based on the initial confirmatory factor analysis (CFA) (Gerbing & Anderson, 1988). As shown in Table 1, this study tested the adequacy of the measurements by evaluating the reliability of the individual measures, convergent validity, and the discriminant validity of the constructs (Hulland 1999). Each investigated measurement construct yielded a Cronbach's alpha value and composite reliability of greater than .70 (Hair et al., 2018). The convergent validity of measurement at both the item and construct levels was good, showing that all individual item loadings were greater than .70 (Gefen, Straub, and Boudreau 2000). An AVE greater than .50 manifested a construct that shared more variance with its indicators than with error variance (Fornell and Larcker 1981). Thus, all measurement items exhibited good convergent validity. This study tested discriminant validity by comparing the correlations among constructs and AVE values (Fornell & Larcker, 1981). All constructs showed discriminant validity since all correlations were lower than the square root of the variances extracted (Hair et al., 2018) (see Table 2 for details).

Table 1: Results of the Measurement Model (n=247).

Construct and measurement item	Mean (Std.)	Factor loading
Behavioral intention (Composite Reliability = 0.916; Cronbach α = 0.862; AVE = 0.784)[a]		
I will consider Santa Clara as the first choice for my trip.	3.61 (.85)	0.874
I intend to visit Santa Clara in my next trip.	3.61 (.91)	0.913
I plan to visit Santa Clara in the future.	3.94 (.83)	0.869
Telepresence (Composite Reliability = 0.881; Cronbach α = 0.798; AVE = 0.712)[a]		
I feel I am in the place.	4.10 (.79)	0.843
I want to have a realistic experience through the virtual tour.	4.17 (.71)	0.842
The virtual tour will complement a real tour.	4.04 (.80)	0.846
Attitude (Composite Reliability = 0.945; Cronbach α = 0.913; AVE = 0.851)[b]		
Based on your virtual tour experience, please answer the following questions. My attitude toward the virtual tour was:		
Bad – Good	4.52 (0.67)	0.926
Negative – Positive	4.48 (0.72)	0.906
Unfavorable – Favorable	4.48 (0.68)	0.936
Contents Quality (Composite Reliability = 0.889; Cronbach α = 0.814; AVE = 0.728)[a]		
The virtual tour should give me an overview Santa Clara.	4.20 (.71)	0.855
The Virtual Tour should provide relevant information of Santa Clara to my travel plans.	4.19 (.69)	0.856
The Virtual Tour should be easy to navigate around Santa Clara.	4.13 (.73)	0.849
System Quality (Composite Reliability = 0.871; Cronbach α = 0.779; AVE = 0.693)[a]		
The virtual tour should be easy to maneuver or navigate.	3.85 (.94)	0.837
The interface of the virtual tour should be user friendly.	4.05 (.87)	0.851
The Virtual Tour should be interactive.	4.09 (.75)	0.808
Vividness (Composite Reliability = 0.930; Cronbach α = 0.910; AVE = 0.691)[a]		
The imagery of this virtual tour was vague/clear.	4.68 (.60)	0.758
The imagery of this virtual tour was weak/vivid.	4.28 (.80)	0.827
The imagery of this virtual tour was fuzzy/sharp.	4.36 (.82)	0.867
The imagery of this virtual tour was vague.	4.36 (.81)	0.817
The imagery of this virtual tour was vivid.	4.40 (.75)	0.861
The imagery of this virtual tour was sharp.	4.38 (.76)	0.852

[a] A 5-point Likert-type scale, 1: strongly disagree to 5: strongly agree.

[b] A 5-point semantic differential scale.

Table 2: Correlation matrix and discriminant assessment.

	1	2	3	4	5	6
1. Content quality	**0.853**					
2. System quality	0.685	**0.833**				
3. Vividness	0.557	0.445	**0.831**			
4. Attitude	0.594	0.530	0.691	**0.923**		
5. Telepresence	0.796	0.698	0.575	0.557	**0.844**	
6. Behavioral intention	0.578	0.561	0.334	0.499	0.560	**0.886**

* p<.05, ** p<.01

Structural model and hypothesis testing

As shown in Table 3, all proposed hypotheses were supported at $p < .01$. The PLS-SEM analysis provides empirical support for the mediating role of attitude toward VR and telepresence on customer behavior intention, respectively. To test multiple mediation effects, we additionally checked both specific indirect effects and total indirect effects by running a bootstrapping procedure (Hair et al., 2018). The direct relationship between content quality and behavioral intention ($\beta = .265$, $t = 5.570$) and the direct relationship between system quality and behavioral intention ($\beta = .158$, $t = 3.892$) is also significant. Similarly, the direct relationship between vividness and behavioral intention is statistically significant ($\beta = .206$, $t = 5.566$). As shown in Table 4, all specific indirect effects are significant. Therefore, both attitude toward VR and telepresence fully mediate the relationship between three independent variables and behavioral intention.

Table 3: Results of hypothesis test[a].

Structural Paths	**β**	**S.E.**	***t*-ratio**	**Hypothesis Testing**
Contents quality → Attitude (H1)	0.194	0.078	2.499**	Supported
Contents quality → Telepresence (H2)	0.518	0.080	6.534**	Supported
System quality → Attitude (H3)	0.170	0.061	2.825**	Supported
System quality → Telepresence (H4)	0.272	0.076	3.518**	Supported
Vividness → Attitude (H5)	0.509	0.068	7.431**	Supported
Vividness → Telepresence (H6)	0.165	0.043	3.861**	Supported
Attitude → Behavioral intention (H7)	0.271	0.067	4.010**	Supported
Telepresence → Behavioral intention (H8)	0.411	0.063	6.534**	Supported

[a] R^2 for Attitude = .556[1]; R^2 for Telepresence = .697[1]; R^2 for Behavioral intention = .364[1]; * p<.05, ** p<.01

[1] As suggested, R^2 values of .75, .50, and .25 are considered substantial, moderate, and weak (Hair et al., 2018).

Table 4: Robust analysis: Mediation test[a].

Indirect effect	β	S.E.	*t-value*	*p-value*	95% Confidence Interval	Significance ($p < .05$)
CQ → Attitude → BI	0.052	0.025	2.124	0.034	[0.015, 0.116]	Yes
SQ → Attitude → BI	0.046	0.020	2.287	0.022	[0.015, 0.099]	Yes
Vivid → Attitude → BI	0.138	0.040	3.407	0.001	[0.064, 0.221]	Yes
CQ → Tele → BI	0.213	0.045	4.733	0.000	[0.131, 0.309]	Yes
SQ → Tele → BI	0.112	0.038	2.868	0.004	[0.051, 0.207]	Yes
Vivid → Tele → BI	0.067	0.020	3.470	0.001	[0.034, 0.113]	Yes

Conclusion and Discussions

With the advanced development of technology, VR becomes an emerging technology in the tourism industry. VR provides an opportunity for customers to experience a destination before they visit the place. VR enables potential customers mentally imagine their future consumption experience through VR. To better understand the importance of VR attributes and customers' behaviors in the context of tourism consumption, this study identified factors that encouraged customers have positive attitude and telepresence through the VR activities, which further influenced their behavioral intention, based on the DeLone and McLean's information systems success model (2003). Specifically, this study developed and examined a theoretical framework for the relationships among content quality, system quality, vividness, attitude, telepresence, and behavioral intention in the context of destination VR.

Results of this study identified significant effects of customers' VR experience on their telepresence and attitude. When VR had content quality, system quality, and vividness attributes, customers were more likely to have telepresence and positive attitude toward the VR. In turn, customers' positive attitude toward the VR and telepresence showed positive effects on their behavioral intention to visit the destination. This study shed light on what kind of VR features should be provided to prospective customers, extending the current literature on VR. Results extended the current knowledge on VR, emphasizing the importance of system quality, content quality, and vividness from DeLone and McLean's information systems success model. Results also suggested VR should be developed user friendly, interactive, and vividly rich content to encourage customers feel the presence in the destination and to develop positive attitude toward the VR experience. Customers' positive attitude toward the VR and their feeling of presence eventually led to their intention to visit the destination.

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