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Predicting Intention to Continue Using E-Tourism Technologies amidst Covid-19 Endemic: A PLS-SEM Approach

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Abstract: After almost two years of stalling, the tourism sector is now thriving as we move into the Covid-19 endemic phase, making travel safer. Therefore, continuous use of personalized immersive technology that can deliver timely information and shield users from the outbreak is essential. This study looks at how travellers intend to continue using e-tourism technologies which include augmented reality, social media, smartphone apps, smart technologies, websites and reservation systems. Purposive sampling was used to select 200 respondents who were above 18 years old to participate in a survey that was based on the Expectation-Confirmation Model. The acquired data was then examined using PLS SEM for hypothesis testing. The results showed that satisfaction with e-tourism technologies was the most significant predictor of motivation to keep using such technologies. Further discussion includes contributions to the field of knowledge as well as for players, developers and service providers in the tourism sector.

Keywords: *Continuance Intention, Covid-19, E-tourism Technologies, Satisfaction.*

1. Introduction and Background

The United Nations World Tourism Organization (UNWTO) reported that in 2020, the number of foreign visitors declined by 60% to 80% (WTO, 2020). Similarly, in Malaysia, domestic tourist expenditures decreased by 60.8% from RM103.2 billion in 2019 to RM40.4 billion in 2020 as domestic tourist numbers decreased due to Covid-19 movement restrictions (Bernama, 2020). Therefore, countries are having a hard time reviving their economies, particularly through tourism recovery. They must come up with measures to entice tourists to visit their own countries, as disease prevention is one of the top concerns among travellers today. Malaysia had 4.5 million confirmed cases in June 2022, with 35,732 deaths (Ministry of Health, 2022). Various precautionary actions have been implemented worldwide during the Covid-19 situation. Social distancing, use of masks, and seclusion of one's self are employed to prevent direct interaction with individuals. These steps are taken to make sure that the spread of Covid-19 was limited to an absolute minimum (Wilder-Smith, 2020; Kuc-Czarnecka, 2020; Korzeb & Niedziółka, 2020) and that the people of the country were resilient. Simultaneously, the government began immunizing the entire population. As of June 2022, 28 million individuals in Malaysia had received at least one dose of vaccination (Ministry of Health, 2022).

By the end of June 2023, Malaysia is expected to complete the transition from the pandemic to the endemic phase of the outbreak (Yusof, 2023). Nevertheless, consumers are advised to still be cautious regarding daily activities, particularly in public places, while ambiguity about the novel Covid-19 continues. Covid-19 and the significance of tourism to Malaysia's economic development necessitate tourism operators to come up with a marketing plan that keeps their destinations competitive while also disseminating the most recent information about the problem. Consumers' demand for e-tourism technologies is driven by the extensive use of today's technology. As travel becomes more convenient and safer, people might require more motivation to travel. One strategy for doing so is to provide unique, fascinating technological experiences. Unanswered is the question of whether travellers will use technology during this period to get prompt information and safeguard themselves during the endemic phase.

Thus, this study incorporated the Expectation-Confirmation Model (ECM) to determine tourists' intention to continue using e-tourism technologies amidst Covid-19 endemic. With the help of these technologies, the tourists could stay resilient and avoid the red spots. As such, SmartPLS software was used to examine the ECM aspects of confirmation, perceived usefulness, and satisfaction toward continued intention to utilize e-

tourism technology.

2. Literature Review

E-Tourism Technologies: Pourfakhimi, Duncan, Ould, Allan, and Coetzee (2020, p. 3) claimed that e-tourism technologies are more than just online hotel booking and airline ticketing. They classify e-tourism technologies as a variety of technologies, including "mobile technologies, self-service technologies, social media, mobile applications, augmented reality, and smart technologies." The tourism and hospitality industries have benefited the most from these technological advancements due to their demands and features (Kennedy-Eden & Gretzel, 2012).

Expectation-Confirmation Model (ECM): Using the Expectation Confirmation Theory (ECT), Bhattacherjee (2001) developed the ECM, a research paradigm for information systems (Lee, et al., 2011). However, Bhattacherjee (2001) argued that actual use of information systems shapes customer expectations and confirmation of the information system's usefulness, which motivates continuous usage intention which led to the introduction of ECM, as depicted in Figure 1. The consequence of real use of the information system is evaluated during confirmation in the ECM. Consumers develop trust in the results and evaluate the usefulness of the system if the result meets their expectations. Satisfaction encompasses both fulfilment of a person's wants, needs and desires as well as the person's belief that his or her needs are met. Hence, the interplay of confirmation and perceived usefulness leads to satisfaction.

Continuance Intention: The primary dependent variable in the current study is continuance intention which is the desire to reuse a system or utilize it repeatedly (Bhattacherjee, 2001). The intention of tourists to keep utilizing e-tourism technology is what is meant by continuance intention in this current study. Despite the fact that most of them are focused on person-level decision-making, both the individual and organizational levels of analysis have addressed studies on information system continuation (Hossain & Quaddus, 2012). The current study focuses on the individual level of analysis and posits that e-tourism technology continuance intention is a mental state reflecting an individual's choice to continue repeating their current behavior. This mental state is comparable to the intention to repeat a purchase in the marketing industry (Lu, 2014).

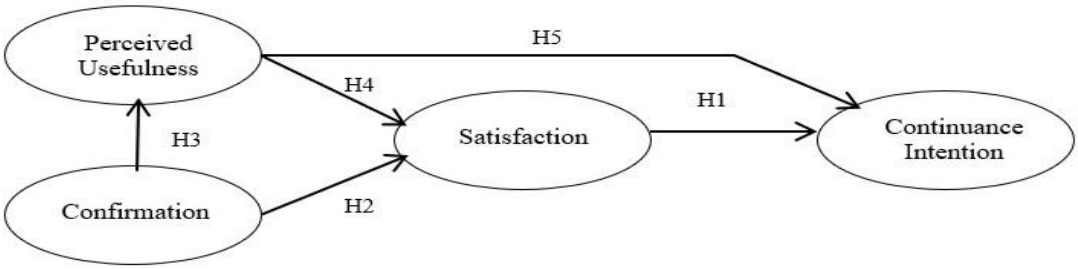
Satisfaction: The term "satisfaction" refers to how customers feel about their previous experiences with information systems (Bhattacherjee, 2001). In their study, Hsiao and Chang (2013, p. 3) defined "satisfaction as a consumer's positive emotional state as a result of using mobile advertising." On top of that, Bhattacherjee (2001, p. 355) further explained that "user satisfaction is influenced by two factors: information system expectations, and confirmation of expectations following actual use. Users assess their satisfaction or evaluative response by comparing it to their expectations." Customer satisfaction has been found to influence consumers' continuance intentions as a result of cognitive, emotional, and conative loyalty in an e-commerce B2C model (Yuksel, et al., 2010). Several previous studies have discovered favorable direct links between satisfaction and the desire to continue (Thominathan & Ramayah, 2014). Besides, numerous researches in various fields have demonstrated the favorable impact of customer satisfaction on use (Al-Hattami, 2021) as well as usage continuance (Al-Hattami et al., 2021). As a result, in this investigation, the following hypothesis is proposed:
H1: Satisfaction positively affects continuance intention.

Confirmation: The fascinating factor of confirmation influences perceived usefulness and satisfaction favorably, which can all result in a continuance intention. In practice, confirmation entails self-evaluation and meeting service standards. Confirmation is the process of comparing things (Bhattacherjee et al., 2008). According to Bhattacherjee (2001), disconfirmation (perceived performance lagging expectation) specifies that the expectation has not been satisfied, whereas confirmation (perceived performance meeting expectation) implies that the benefits of using information systems have appeared as expected. Expectations were reinforced before the consumer was satisfied, according to Liao et al. (2007). Both factors were considered in the study as key factors. Confirmation of expectations, according to Wen et al. (2011), has a favorable impact on perceived usefulness and satisfaction, resulting in continued behavior. Tourists will compare their real experience visiting a tourism destination to their initial expectations. They will be satisfied with the sights if their expectations are met. Furthermore, Chong (2013) agrees that the degree of

confirmation would rise and enhance consumer satisfaction and the perceived usefulness of mobile commerce services. Thus, the following hypotheses are offered in this study:
H2: Confirmation positively affects satisfaction.
H3: Confirmation positively affects perceived usefulness.

Perceived Usefulness: Perceived usefulness is the individual's belief that using a particular technology improves the caliber of their work output (Davis, 1989; Bhattacherjee, 2001). Previous studies have discovered a relationship between perceived usefulness and satisfaction (Hsiao, Chang, & Tang, 2016; Oghuma, et al. 2015; Thominathan & Ramayah, 2014), as well as the relationship between continuance intention and perceived usefulness (Oghuma et al., 2016; Oghuma et al., 2015; Thominathan & Ramayah, 2014). Perceived usefulness, according to a few earlier studies, positively affects user satisfaction and intention to continue using information systems (Bölen & Zen, 2020; Chong, 2013; Foroughi et al., 2019). Hence, the hypotheses are listed as follows:
H4: Perceived usefulness positively affects satisfaction.
H5: Perceived usefulness positively affects continuance intention.

Figure 1: Presents the Research Framework



3. Research Methodology

The determinants of continuance intention to use e-tourism technologies among Malaysian tourists are examined in this current study. An online survey of 230 respondents had been administered via Google Forms. This study used a purposive sampling technique when selecting Malaysian tourists. Before that, tourists aged 18 and above had been identified as the targeted population and each of the respondents was required to have utilized at least one of the e-tourism technologies discussed in the Literature Review section. After removing the incomplete responses, 200 responses were accepted as valid for data analysis. The administered questionnaire consists of two main sections namely Section A which comprises questions focusing on the demographic profiles of respondents as well as the usage of e-tourism technologies and Section B which includes questions related to measuring the determinants of e-tourism technologies' continuance usage intention among tourists. This study adapted measurement items from a range of sources. The items for Confirmation, Satisfaction and Continuance Intention were adapted from Bhattacherjee (2001) and Chong (2013) whereas the items for Perceived Usefulness were adapted from Chong (2013). All items were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

4. Results and Discussion

Demographic Profile

Table 1: Respondents' Demographic Characteristics

Variable	Percentage
Gender	
Male	23%
Female	77%
Age	

18 – 20	18.5%
21 – 30	58.5%
30 and above	33%
Ethnicity	
Malay	97%
Chinese	2%
Indian	1%
Educational level	
Diploma	32%
Bachelor's degree	50.5%
Postgraduate degree	17.5%
Employment	
Government sector	17.5%
Housewife	1%
Private sector	8%
Self-employed	2.5%
Student	71%
Monthly income	
Below RM2000	68%
RM2001 – RM5000	13%
RM5001 – RM8000	10.5%
RM8001 – RM11000	7.5%
Above RM11000	1%
User of any e-tourism technologies?	
Yes	78.5%
No	21.5%
Frequency of e-tourism technology usage	
Extremely frequent	8%
Quite frequent	14%
Slightly frequent	21.5%
Neither	1.5%
Quite infrequent	18.5%
Slightly infrequent	15.5%
Extremely infrequent	6%

According to the respondents' demographic characteristics in Table 1, 77% of the samples were female and 23% were male. The largest of the samples' respondents (58.5%) ranged in age from 21 to 30; next, 33% were over the age of 30; and the remaining 18.5% were between the ages of 18 and 20. For ethnicity, 97% of them were of Malay ethnicity and the rest were made up of Chinese and Indian. Regarding educational level, most of the respondents hold a bachelor's degree (50.5%), 32% have a diploma and 17.5% have a postgraduate degree. Students made up 71% of the responses overall. This finding clearly elucidates another finding which exposes that most of the respondents received a monthly salary below RM2000. On the other hand, those who worked in the government sector comprised 18% of the participants with monthly incomes reaching between RM5000 to RM11,000. Apart from that, the samples consisted of those who worked in the private sector (8%), self-employed (2.5%) as well as housewives (1%). Furthermore, 78.5% of the respondents revealed that they are active users of at least one of the e-tourism technologies, and 43.5% of them admitted themselves as frequent users of those technologies.

Data Analysis: Partial Least Squares (PLS) modelling was used to assess the measurement and structural model (Ringle et al., 2015), which does not require the normality assumption, hence data can either be normally or not normally distributed (Chin et al., 2003). Firstly, the researcher tested the issue of Common Method Bias. This is in accordance with the suggestions of Kock and Lynn (2012) and Kock (2015) which is to test the full collinearity if only one source was utilized to obtain the data. This approach involved regressing each variable against a common variable. The full collinearity test for variables such as Confirmation,

Continuance Intention, Perceived Usefulness and Satisfaction are 3.322, 4.412, 2.686, and 4.162 respectively. The analysis produced a VIF of less than 5. Therefore, there is no serious issue with data obtained from one single source.

Measurement Model: To evaluate the model created using a 2-step technique, the researcher adhered to the advice of Anderson and Gerbing (1988). According to the recommendations of Hair et al. (2019) and Ramayah et al. (2018), the measurement model was first evaluated to ascertain the validity and reliability of the instruments utilized. Following that, the structural model was used to evaluate the developed hypotheses. Loadings, average variance extracted (AVE) and composite reliability (CR) were assessed for the convergent validity of the measurement model. As displayed in Table 2, the values are all acceptable because loadings are all higher than 0.708, AVEs are all higher than 0.5 and the CRs are all higher than 0.7 (Hair et al., 2019).

Table 2: Measurement Model

Variable	Item	Loadings	CR	AVE
Confirmation	CONF1	0.871	0.927	0.760
	CONF2	0.878		
	CONF3	0.825		
	CONF4	0.911		
Continuance Intention	CONT1	0.858	0.931	0.729
	CONT2	0.882		
	CONT3	0.902		
	CONT4	0.746		
	CONT5	0.874		
Perceived Usefulness	PU1	0.857	0.938	0.717
	PU2	0.855		
	PU3	0.846		
	PU4	0.855		
	PU5	0.877		
	PU6	0.788		
Satisfaction	SAT1	0.881	0.953	0.804
	SAT2	0.889		
	SAT3	0.907		
	SAT4	0.906		
	SAT5	0.899		

Secondly, the discriminant validity was assessed using the HTMT criterion. Henseler et al. (2015) and Franke and Sarstedt (2019) suggested that the HTMT values should be lower than 0.9. As can be seen in Table 3, there is only one HTMT value which is above 0.9. Consequently, bootstrapping was done to make sure 90% of the bias-corrected intervals (BCI) upper level (UL) values were less than 1. As a result, Table 4 shows that all the values are less than 1. This clearly indicates that HTMT value of 0.913 in Table 3 is not an issue. Hence, the measurement items are considered valid and reliable.

Table 3: Discriminant Validity (HTMT Ratio)

Variable	1	2	3	4
1. Confirmation				
2. Continuance Intention	0.832			
3. Perceived Usefulness	0.816	0.806		
4. Satisfaction	0.841	**0.913**	0.710	

Structural Model: The multivariate skewness and kurtosis were assessed as suggested by Hair et al. (2017) and Cain et al. (2016). The results indicated that the data collected was not multivariate normal as Mardia's multivariate skewness ($\beta = 3.624$, $p < 0.01$) and Mardia's multivariate kurtosis ($\beta = 29.438$, $p < 0.01$). Thus, the suggestions of Hair et al. (2019) were followed whereby the path coefficients, the standard errors, t-values and p-values were reported for the structural model using a 5,000-sample re-sample bootstrapping procedure as documented by Ramayah et al. (2018). Furthermore, criteria namely p-values, confidence

intervals and effect sizes were combined due to the comment made by Hahn and Ang (2017) that p-values per se are a poor standard for determining if a hypothesis is significant.

Next, the effect of the 2 predictors on Continuance Intention was tested which revealed that the R^2 was 0.771 (Q^2 = 0.556). This indicates that Satisfaction and Perceived Usefulness explains 77.1% of the variance in Continuance Intention. Satisfaction (β = 0.635, p< 0.01) and Perceived Usefulness (β = 0.317, p< 0.01) were all positively related to Continuance Intention, thus H1 and H5 were accepted. Subsequently, the effect of Confirmation (β = 0.634, p< 0.01) and Perceived Usefulness (β = 0.190, p< 0.01) on Satisfaction is tested with an R^2 of 0.617 (Q^2 = 0.490) which shows that Confirmation and Perceived Usefulness explain 61.7% of the variance in Satisfaction which confirms H2 and H4. Finally, the researcher tested the effect of Confirmation (β = 0.744, p< 0.01) on Perceived Usefulness, with an R^2 of 0.553 (Q^2 = 0.389), highlighting that Confirmation explains 55.3% of the variance in Perceived Usefulness, consequently supporting H3. The overview of the criteria used to assess the proposed hypotheses is shown in Table 4.

Table 4: Hypothesis Testing

Hypothesis	Relationship	Std. Beta	Std. Dev.	t-value	p-value	BCI LL	BCI UL	f^2
H1	SAT -> CONT	0.635	0.063	10.112	p< .001	0.524	0.732	0.992
H2	CONF -> SAT	0.634	0.064	9.984	p< .001	0.527	0.734	0.469
H3	CONF -> PU	0.744	0.038	19.823	p< .001	0.674	0.799	1.239
H4	PU -> SAT	0.190	0.074	2.566	0.005	0.067	0.312	0.042
H5	PU -> CONT	0.317	0.065	4.886	p< .001	0.214	0.426	0.247

Note[1]: Confirmation = CONF, Continuance Intention = CONT, Perceived Usefulness = PU and Satisfaction = SAT. Note[2]: The researcher uses a 95% confidence interval with a bootstrapping of 5,000

The use of PLS-Predict, as suggested by Shmueli et al. (2019), is a more current and up-to-date technique to assess predictive relevance. The holdout sample-based method PLS-Predict provides case-level predictions on an item or construct level and uses a 10-fold technique to validate predictive relevance. According to Shmueli et al. (2019), if all of the item differences (PLS-LM) are negative, there is strong predictive power; if most of the item differences (PLS-LM) are negative, there is moderate predictive power; if a minority of the item differences (PLS-LM) are negative, there is low predictive power; and if none of the item differences (PLS-LM) are negative, there is no predictive power at all. Only a small percentage of the PLS model's errors were lower than those of the LM model, as seen in Table 5. Hence, it may be asserted that the model's predictive potential is considered to be low.

Table 5: PLS-Predict

	PLS		LM		PLS-LM		Q^2 Predict
Item	RMSE	MAE	RMSE	MAE	RMSE	MAE	
CONT1	0.521	0.413	0.530	0.415	**-0.009**	**-0.002**	0.401
CONT2	0.562	0.404	0.551	0.391	0.011	0.013	0.424
CONT3	0.485	0.375	0.475	0.359	0.010	0.016	0.462
CONT4	0.675	0.507	0.680	0.508	**-0.005**	**-0.001**	0.286
CONT5	0.503	0.386	0.503	0.368	0.000	0.018	0.470

Discussion: This current research aims to investigate the continuance intention to use e-tourism technologies amongst Malaysian tourists amidst Covid-19 endemic. The findings reveal that satisfaction has a stronger positive impact on continuance intention in using e-tourism technologies compared to perceived usefulness. This demonstrates that Malaysian holidaymakers view the satisfaction they experience from utilizing e-tourism technologies as being far more essential than the technology's usefulness. These outcomes are consistent with earlier research, such as that of Yuksel et al. (2010), Hsiao and Chang (2013), Chong (2013), Thominathan and Ramayah (2014), and Al-Hattami et al. (2021). Notwithstanding, the perception of the technologies being useful to the tourists in determining their continuance usage is comparatively significant as the findings in this study corroborate well with results from previous research done by Chong (2013), Foroughi et al. (2019) and Bölen and Özen (2020).

The characteristics that affect tourists' satisfaction with e-tourism technologies, which in turn affects their intention to use the technologies in the future, are supported by the study's hypotheses. The investigation's findings are intriguing. It was found that confirmation affected user satisfaction with e-tourism technology more than perceived usefulness. This shows that the extent to which tourists' expectations are met—rather than whether or not they believe the technologies are useful to them—has a substantial effect on customers' satisfaction with e-tourism technology. Undoubtedly, the finding is supported by earlier studies by Oghuma et al. (2016), Oghuma et al. (2015), Lu (2014), Thominathan and Ramayah (2014), Chong (2013) and Hsiao and Chang (2013).

Finally, this research investigates the association between confirmation and perceived usefulness. As a result, this research clearly confirms the finding which strongly proves that tourists' perceived usefulness of e-tourism technologies is boosted by confirmation. In other words, if the expectations among the tourists are confirmed, the technology will appear to be enormously useful to them. This is consistent with past studies that found a substantial connection between confirmation and perceived usefulness (Wen et al., 2011; Chong, 2013).

5. Conclusion

The purpose of the current research was to determine how perceived usefulness, confirmation, and satisfaction affected Malaysian tourists' intentions to continue using e-tourism technologies. However, there are several drawbacks to this research. To start with, Malaysian tourists were chosen for this study using a purposive selection technique. It is recommended that future research should employ suitable probability sampling methods to overcome generalization issues. Secondly, the majority of the samples were mainly students. In the future, potential researchers should increase the number of respondents to cover other segments of tourists. Thirdly, the current study only examined a limited number of variables based on ECM. Future studies could, perhaps, integrate other appropriate constructs based on the latest literature recommendations to gain better prediction power of continuance intention in e-tourism technologies.

Overall, this study confirms that the intention to use e-tourism technologies in the future is positively impacted by satisfaction with those technologies. Also, how well e-tourism technologies meet visitors' expectations is unquestionably related to that satisfaction. All things considered, the findings suggest that the model does a decent job of explaining the factors that affect satisfaction and continuance intention to utilize e-tourism technologies.

Paper Contribution to Related Field of Study: The results of this survey show that young travellers between the ages of 21 and 30 made up the majority of those who used e-tourism technologies. It is known that young users assess the innovation regardless of whether it is for first-time use or continuance use. As such, with regards to satisfaction and continuance intention to use e-tourism technologies, the beliefs of the usefulness of those technologies are prominent as presented in the study's findings. Thus, to promote satisfaction and facilitate continuance intention among young users as tourists in this modern world and at the same time be resilient to the Covid-19 disease, e-tourism technologies ought to be personalized to the specific needs of the users as well as be designed to have usability and utility for the users. In detail, e-tourism technologies should be specifically built with a visually attractive and user-friendly interface, coupled with a clear layout and powerful navigation to accommodate relevant, accurate, up-to-date and comprehensive information for young consumers and future generations.

From a conceptual standpoint, this research has several unique contributions. In Malaysia, research on post-adoption environment namely continuance intention is still insufficient to comprehensively understand the phenomenon. Therefore, to provide empirical data in the field and offer additional details on customers' intentions to repeatedly use a certain system, further research on continuance intention is required. As a result, this study adds to the body of existing knowledge since it illustrates the growth of the literature on continuing usage intention and adds critical new information to the literature on the post-adoption environment. Additionally, this study succeeded in substantiating Bhattacherjee's (2001) ECM by identifying Malaysian tourists' continued intention to use e-tourism technologies.

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