# The Moderating Effect of Smart Tourism Technologies: Tourist Destination Loyalty Success in Dili (Timor Leste)

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#### Abstract

The research focuses on testing and analyzing the influence of several components of tourist destination loyalty, namely tourist satisfaction, experience quality, and smart tourist technologies which as a moderator variable. The research uses a quantitative method to see the influence of each variable. The respondents of the research are from various backgrounds, with a total of 317 visitors (210 women) and (107 men) who have visited tourist attractions of places historical locations in Dili (Timor Leste). The processing data use SEM-PLS, and the results of processing data show that all hypotheses significantly influence (direct) and (indirect hypotheses: smart tourist satisfaction is able to be a good moderator variable between experience quality and tourist satisfaction). The theory implication as a development of behavior and smart technologies theory, as well as the practical implication of being a strategic policy maker for stakeholders. The novelty of the research is that experience quality is in the form of physical and non-physical experiences that have positive emotions that are felt and shared with everyone so that there is satisfaction for visitors and tourist attractions.

Keywords: smart technologies, satisfaction, place historical

JEL : L83, M31

DOI : 10.24002/kinerja.v28i2.9454

Received: 06/28/2024 Reviewed: 08/12/2024 Final Version: 09/02/2024

4 INTRODUCTION

### 1. INTRODUCTION

Marketing is something that is closely related to the behavior or activities of a person or group of people to market products to consumers or other business people, which can improve the economy. Marketing is an important part of promoting a place

that has historical value and identity (Fu et al., 2018). In order to maintain and increase competitiveness, places need to think more about competitive advantages, especially as this place is a tourism sector (Zbuchea 2014). It is said that the aim of tourism is to increase economic growth in all aspects, both internal and external. This goal is very important considering the fact that Timor Leste has interesting historical tourist attractions to visit.

One of the important elements of a tourist destination is being able to accept existing changes, namely the level of competition (Chiappa et al., 2014; T.T Trinh & C. Ryan, 2016). Then, tourist places face the challenge of attracting visitors while maintaining their financial sustainability (Sandell & Janes, 2007). It is clear that tourist places provide and present various kinds of creativity and innovation in order to maintain the continuity of relationships between stakeholders and visitors (Sheng & Chen, 2012; Dirsehan & Yalçin, 2011; Siano et al., 2010). The visitors should receive a variety of services that inspire them in a friendlier, healthier, and more comfortable environment (Chan et al., 2009). Stakeholders should be able to increase aesthetic value, provide good service, and communicate well with visitors (Vesci et al., 2021). This research has the urgency that it is necessary to maintain the existence of historical places because history is knowledge that provides explanations about events that really happened in the past, so its existence needs to be maintained so that it can be studied by future generations, adding to cultural richness so that this has an impact on add value (increasing economic value, historical value and cultural value).

Tourism destinations must develop high-quality products and services that align with visitors' expectations and needs (Uysala and Hagan, 1993; Ngwira & Bello, 2018). The quality presented and provided must be able to refer to the visitor's impression that what is obtained can provide satisfaction for the visitor (Han and Hyun 2015). Currently, visitors want not only to enjoy or buy quality services but also to look for memorable experiences with more value (Pine and Gilmore 1998). Therefore, tourist places must focus on the experiences felt by visitors who come from various ages and backgrounds (Vesci et al. 2021) because tourism is considered one of the suitable places to gain experience, relieve boredom after doing activities, a fun place to get ideas, increase motivation (Xu et al., 2019).

The existence of products and services provided by tourist places causes visitor loyalty, where it can be seen that the majority of visitors want or make return visits because, psychologically, there is stimulation within themselves to enjoy the product or service and recommend it (Han et al., 2019). At this time, loyal visitors are the essence of survival (Piancatelli et al. 2021) and are a social basis for the development of tourist attractions (Chen, 2019). Elements in the form of satisfaction drive the attitudes and feelings that visitors have. In this case, satisfaction is individual feelings that describe feelings of pleasure or disappointment regarding what has been seen, felt, and enjoyed about the products and services received. Tourist satisfaction is a visitor's perception of what is expected to be fulfilled or exceeded, as reflected in the benefits obtained, a feeling of pleasure or satisfaction or vice versa (Li et al., 2016; Piancatelli et al., 2021; Chen, 2019; Meeprom & Silanoi, 2020). Several studies include Massimiliano et al. (2021), conducting research on experience quality, satisfaction, and word of mouth (WOM) of visitors. Verma & Rajendran (2017) on historical nostalgia, perceived value, satisfaction, and loyalty, and Jimber et al. (2020) also conducted research on expected quality, received quality, perceived value, satisfaction, and loyalty. These researchers did not discuss the existence of smart technologies tourism, while there was concern shown by certain parties regarding the importance of preserving history by using smart technologies tourism. Tourism to historical places can create value for the community as visitors (Preko et al., 2020). According to Zeithaml (1988), perceived value is an overall assessment of the usefulness of a product based on perceptions of what is received and what is released. Visitors' overall assessment of the usefulness of a product or service is based on what visitors have received and what visitors have given (Meeprom, S., & Silanoi, T. 2020). The importance of value perceived by visitors is the main goal of organizations and a means of maintaining sustainable competitive advantage (Sanchez et al., 2006). The theory used in research as a basis for forming the model is TAM theory (Gwiazdzinki et al., 2020; Wen et al., 2023) and SET (Cropanzano et al., 2017; Shewach & Sackett, 2016)

The existence of a feeling that is realized in the form of value has an impact on visitor satisfaction (Piancatelli et al., 2021). Apart from that, smart tourism technologies can moderate the influence of the quality of the experience felt by visitors, which impacts satisfaction. Smart tourism technologies are a form of change based on existing technology, so this is a Smart evolution as a business strategy and organizational performance. The existence of the theory that became the basis for the formation of the conceptual model was motivated by the existence of the technology acceptance model (TAM) and social exchange theory (SET), which discuss the function of technology and a person's behavior to carry out a certain action To test and analyze the antecedents of tourist destination loyalty, where there is the role of smart tourism as a moderating variable and tourist satisfaction as a mediating variable, there is something unique about smart tourism technologies as something that has greater sustainability value.

#### 2. LITERATURE REVIEW

### 2.1. Experience Quality

Experience quality is the awareness and feelings of behavior, especially of visitors, in utilizing products or services provided by stakeholders, in this case, tourism providers, the existence of products and services that have been provided to visitors in this case as a form of stimulus to behave emotionally regarding what they have enjoyed or utilized (Grundey 2008, Hussein *et al.* 2018). The products and services provided are, of course, not just simple but have added value to give visitors a special impression. Another opinion from Lemon & Verhoef (2016) and Klaus et al. (2013) states that there is a subjective response, and visitors give two-way communication regarding what they feel. This is an emotional reaction from the visitor.

# 2.2. Tourist Destination Loyalty

The same thing states that loyalty is a commitment held by visitors that there is a great desire to visit again, and not only that, the visitor's desire to be involved in events provided by tourism site managers, it is within visitors to consistently visit again and want to share. Experience the people around you (Nguyen et al., 2018; Kumar et al., 2021), it can be said that loyal visitors are visitors who repeat

themselves to visit tourist attractions in the same place and share the moment with other parties. According to Griffin's (2005) opinion, there are four (4) types of loyalty related to levels, which include (1) no loyalty, which is related to some visitors who do not develop loyalty. This is said to be at the low level; (2) inertia loyalty is in the form of a type of visitor loyalty where there is low engagement with high repeat visits. This is done because of a condition: (3) latent loyalty is the existence of a relatively high level of loyalty or attachment combined with a low level of repeat visits; (4) premium loyalty is something that has a high level of attachment that runs in accordance with the activities of repeated visits. Griffin (2005) states that loyalty characteristics are divided into five (5) in the form of (1) making regular return visits, (2) visit sections that have almost the same value, (3) referring to other people, namely visitors communicating by word of mouth; (4) shows visitor immunity to competing places and (5) there is rejection from visitors that other places provide alternative products and services.

### 2.3. Tourist Satisfaction

Tourist satisfaction is a form of visitors' perception that what they thought, what they expected, has been fulfilled or has been exceeded, is reflected in the presence of satisfaction for visitors for what they have obtained, which can provide added value indirectly this has a major impact on psychological conditions from visitors (Prayag *et al.* 2013, Zhang *et al.* 2020). Several studies have existed (Huang et al., 2016; Ma et al., 2013) stated that satisfaction has a fairly broad meaning, which, in general, is not only a feeling of satisfaction from the product or service received but also the costs incurred to obtain the desired value and the expectations that are fulfilled by visitors, opinion from (Garcia et al., 2020) which says that satisfaction is the main component that is able to influence visitors to carry out a certain behavior.

# 2.4. Experience Quality Towards Tourist Destination Loyalty

It can be said that experience quality offers other activities presented by tourist attractions apart from the products or services provided, such as a supportive environment, activities in the form of exhibitions, and treatment given when visitors are present (Vesci et al., 2021; Brida, 2016) it is hoped that what visitors want or need can be fulfilled. Experience quality can be concluded as an assessment of visitors' feelings regarding the weaknesses and strengths of products, services, and other things.

**H1:** Experience quality influences tourist destination loyalty.

# 2.5. Experience quality in tourist satisfaction

There is great self-confidence that what has been done and what has been obtained as an attribute has been passed through various interrelated processes (Alshihre et al., 2020; Chou, 2020). In this case, tourism site managers must be able to provide, present, and maintain what is unique about the tourism site because this uniqueness is easy for visitors to remember and utilize. Several values exist in tourist satisfaction (Dutka, 2008), which include attributes related to products in the form of (value price relationship, product quality, product benefit, product design, product reliability or consistency, range of a product or service; attributes related to the service (guarantee, guarantee, delivery, complaint handling and resolution of

problems); attributes related to purchase (communication, courtesy, company reputation, company competence and ease or convenience of acquisition).

**H2:** Experience quality influences tourist satisfaction.

# 2.6. Tourist Satisfaction with Tourist Destination Loyalty

Tourist destination loyalty describes something that is not easy to get and requires a lot of energy, money, and time. There is a psychological condition closely related to attitudes towards the components presented by the visitors, where this is related to beliefs the existence of likes and dislikes. A decision to do something because of an intention (Veloso et al., 2021).

**H3:** Tourist satisfaction influences tourist destination loyalty.

# 2.7. Smart Tourism Technologies

This refers to the use and utilization of ICTs in carrying out processes carried out by tourism actors, and in this case, there are many important roles for players in improving business strategies and tourism performance. There is a combination of the physical world utilizing the digital world through the use of IoT (Gretzel et al., 2015). The existence of an ecosystem is formed by the existence of intelligence from intelligent systems, networks, and destinations, as well as the existence of intelligent infrastructure (Gretzel 2015). On the other hand, a good ecosystem can provide interactions that provide mutual positive benefits, which benefit the whole system and each individual.

The context of smart tourism technologies, in this case, is in the form of high satisfaction for tourists or visitors, a good experience, and a wish that is fulfilled by visitors through various efforts provided by the tourism site (Liberato et al., 2018; Li et al., 2016).

**H4:** Smart tourism moderates the influence of experience quality on tourist satisfaction.

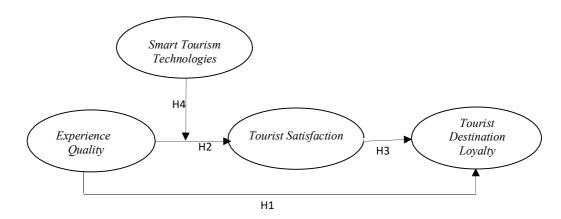


Figure 1. Conceptual Framework

# 3. METHODOLOGY

This research uses quantitative research methods, which is a process that uses data in the form of numbers, which are then analyzed to determine the effect of each hypothesis. The analysis technique uses structural equation modeling (SEM) with SmartPLS software, where structural equation modeling is a multivariate analysis technique used to analyze multiple dependency relationships on latent variables simultaneously so that it is more efficient. The population in this study were tourists or visitors who visited historical sites in Dili with visitor criteria in the form of using at least 2 social media and visiting historical places at least 2 times.

# 3.1. Population and Sample

The population in this study included visitors aged over 15 years and under 50 years, who used at least 2 social media and visited historical places at least 2 times. The total sample obtained was 317 visitors who had different backgrounds spread across various regions. The non-probability sampling technique in this research focuses more on the purposive sampling technique. Non-probability method sampling is determining a sample based on a non-random concept selection, where the procedure for determining the sample for each element of the population is obtained at the unequal chance of being sampled (Leavy, 2017). Criteria for sampling is the sample was taken taking into account that the population size was not known with certainty, so the researcher took samples subjectively, subjectively because researchers have understood that the required information can be obtained from a particular target group able to provide the desired information. They meet the criteria determined by the researcher. The location: Ayauro, Cristo Rei, Dom Aleixo, Metinaro, Nain Feto dan Vera Cruz.

# 3.2. Variables and Measurements

The variables used in the research are the independent variable (experience quality), mediating variable (tourist satisfaction), dependent variable (tourist destination loyalty), and moderating variable (smart tourism technologies). Where experience quality is measured using 6 question items (atmosphere, historical value, positive emotions, education, entertainment (Vesci et al., 2021), tourist satisfaction is measured using 6 question items (internal satisfaction, external satisfaction, positive impact received by visitors, a place that is unique, good service and facilities provided (Jalilvand et al., 2014), tourist destination loyalty is measured using 7 question items (desire to visit again, desire to share information, as a place to learn history, place comfortable, supportive environment, culture that persists and originality (Chen & Phou, 2013) and the smart tourist technologies variable is measured using 7 question items (security, system, interaction, sharing of information, sharing of quality, sharing of quantity and ease of access (Femenia-Serra et al., 2018), all question items used in this research has been adapted to the conditions existing at the researcher's location.

# 3.3. Data Collection Methods

Data collection was carried out using interviews with several visitors based on a questionnaire that had been created and ready to be distributed to visitors. The data collection process was carried out from September 2023 to February 2024. The answers to the questionnaire were in the form of a Likert scale with a range from 1,

which was given as strongly disagree, to 5, which was given as strongly agree. The data that has been collected is then tabulated, and validity and reliability tests are carried out.

# 3.4. Data analysis methods

Data analysis was carried out using smartPLS Version 3.0 software through three (3) stages, namely measuring model evaluation, structural model evaluation, and research hypothesis testing. Evaluation of the measurement model includes testing validity through convergent validity values (outer loading) and reliability through composites and Cronbach's Alpha. A set of data can be said to be valid if it convergently has an outer loading coefficient value > 0.60 (Chin, 1998: 325) and is said to be reliable if the composite reliability value or Cronbach's Alpha is > 0.70 (Hair et al., 2010). Model accuracy testing is carried out through structural evaluation, namely R-Square (R2), Q-Square (Q2) with the formula Q2 = 1 - (1-R21)(1-R22) and Goodness of Fit (GoF) with the formula GoF = V (AVE x R2). Research hypothesis testing is based on a P-value of 5% (0.05), which means that the hypothesis is accepted if the test results show a P-value < 0.05 and vice versa. If the P-value is > 0.05, then the hypothesis is rejected.

#### 4. RESULT AND DISCUSSION

X1.7

The model measurements are evaluated based on the outer loading values for all research variable indicators. The data processing results show that each indicator's outer loading coefficient is between 0.716 - 0.888. This shows that all indicators have an outer loading value greater than 0.50, which means all indicators can be said to be valid (Hair et al., 2019). Viewed through the discriminant value, it shows that the AVE value for all variables has a value > 0.5, with the lowest value being 0.527 and the highest value being 0.691. This can be seen in Table 1.

In the reliability test, it can be seen that the composite reliability coefficient and Cronbach's Alpha values are shown in Table 2, where Table 2 shows the composite reliability and Cronbach's Alpha values are greater than 0.70, which means that all variables can be said to be reliable because this research data has proven valid and reliable (Hair et al., 2019).

**Smart Tourism** Tourist Tourist **Experience** Moderating **Technologies Destination Satisfaction Effect** Quality (X) (Z2) Loyalty (Y) (Z1) Experience Quality (X) \* Smart Tourism 0.897 Technologies (Z2) X1.1 0.763 X1.2 0.822 X1.3 0.792 X1.4 0.746 X1.5 0.716 X1.6 0.746 0.844

**Table 1.** Outer Loading Results

	Experience Quality (X)	Moderating Effect	Smart Tourism Technologies (Z2)	Tourist Destination Loyalty (Y)	Tourist Satisfaction (Z1)
Y1.1			· · · · · · · · · · · · · · · · · · ·	0.723	
Y1.2				0.792	
Y1.3				0.784	
Y1.4				0.866	
Y1.5				0.857	
Y1.6				0.746	
Y1.7				0.813	
Z1.1					0.768
Z1.2					0.751
Z1.3					0.755
Z1.4					0.782
Z1.5					0.888
Z1.6					0.885
Z2.1			0.859		
Z2.2			0.873		
Z2.3			0.853		
Z2.4			0.839		
Z2.5			0.866		
Z2.6			0.779		
Z2.7			0.738		

Source: Data analysis (2024).

Table 2. Validity Test Results

	Average Variance Extracted (AVE)		
Experience Quality (X)	0.527		
Moderating Effect	1,000		
Smart Tourism Technologies (Z2)	0.691		
Tourist Destination Loyalty (Y)	0.638		
Tourist Satisfaction (Z1)	0.560		

Source: Data analysis (2024).

Table 3. Reliability test results

	Cronbach's Alpha	Composite Reliability
Experience Quality (X)	0.835	0.880
Moderating Effect	1,000	1,000
Smart Tourism Technologies (Z2)	0.927	0.940
Tourist Destination Loyalty (Y)	0.905	0.925
Tourist Satisfaction (Z1)	0.810	0.871

Source: Data analysis (2024).

The results of hypothesis testing are based on the results of the SmartPLS 3.0 analysis, which are shown in Figure 2 and Table 4 which can be explained as follows:

Table 4 shows the experience quality of tourist destination loyalty (H1) where the path value is 0.200 and p-value 0.000 < 0.05. In this case, it can be said that sharing positive experiences is a very interesting thing that visitors feel and own. A quality experience is an experience that is able to provide value and positive influence, especially in the souls of visitors. Visitors can enjoy what they have previously thought about in relation to the tourist spot, and they get or feel rewarded for what they have paid for the experience (Allameh et al., 2014). The existence of this quality experience certainly provides a special color for visitors, namely the desire to repeat or visit again, the costs incurred are in accordance with what they get, the service is good and very helpful so that this will have an impact on visitors' desire to visit. Returning, even if only for nostalgia, there is a desire to visit other parties. Visitors will usually visit tourist attractions more often because they have their own unique characteristics that differentiate them from other tourist attractions (Dilep, 2019).

Table 4 illustrates that experience quality has an effect on tourist satisfaction (H2) where the path value is 0.739 with a p-value of 0.000 < 0.05. It can be said that the research results show that there is a positive influence of experience quality on tourist satisfaction. It can be seen that what visitors feel is of better value for themselves and the surrounding environment. There is the experience in the form of impressions that are obtained when and after visiting a tourist attraction, the service received while at the location, a place that is pleasant and provides calm, and a tourist attraction environment that is able to provide inspiration, this will certainly provide satisfaction for visitors. These results are supported by previous research (Domínguez et al., 2019). Study by Domínguez-quintero et al. (2019) with 229 visitors at the Cathedral-Giralda, the Reales Alcázares, and the Flamenco Museum in Seville, Spain, it was seen that experience quality is an objective thing that visitors can feel without any pressure from external parties.

Table 4 presents tourist satisfaction on tourist destination loyalty (H3) with a path value of 0.678 and a p-value of 0.000. It can be said that the research results show a significant influence of tourist satisfaction on destination loyalty, which shows that there is visitor satisfaction when and after visiting a destination. This visitor satisfaction can be realized in the form of a strong desire to revisit a destination, a desire to share with other parties (relatives, friends and the environment). Information can be shared through various media, such as electronic media and non-electronic media. The information that is obtained and shared is information related to positive things. The results of this research are supported by Lee et al. (2015) on 220 visitors at the Chinatown Heritage Precinct (Singapore). The test results showed satisfaction as an affective component that can provide loyalty because of something visitors have felt and enjoyed. Research conducted by Cevdet and Erkut (2015) on 255 visitors to the oldest city in the world, Istanbul, showed that visitor satisfaction in the form of low cost, feeling comfortable and safe, and friendly service had an impact on loyalty.

Table 4 further demonstrates that smart technologies moderate the influence of experience quality on tourist satisfaction (H4) where it can be seen that the path value is 0.108 with a significant value of 0.000, which is smaller than 0.05, so it can be said that the existence of technologies is very helpful in making it easier for visitors to enjoy services provided by tourism site owners, where visitors can easily access all information when they are at the tourist site location. The existence of smart

technologies in the form of a platform located at the location in the form of using applications that have been provided, various game applications that can automatically be played with a remote system, no need to queue when entering the tourism area, no need to queue to enjoy the menu or anything else presented by tourist attractions. The results of this study are supported by research (Francisco et al., 2018; Chiappa & Baggio, 2015; Jovicic, 2017). Research from Francisco (2018) shows that fast and intelligent changes must be supported by fast and intelligent capabilities, in this case, smart technologies, which can be seen from sharing information, sharing data, and sharing experiences, something that impacts visitor satisfaction.

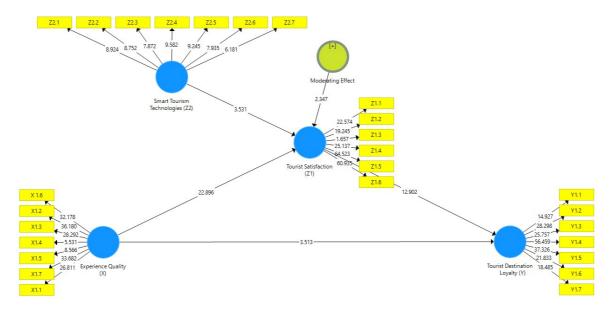


Figure 2. SEM Model

Table 4. Effect Test Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
Experience Quality (X) -> Tourist Destination Loyalty (Y)	0.200	0.200	0.057	3.513	0.000
Experience Quality (X) -> Tourist Satisfaction (Z1)	0.739	0.742	0.032	22.896	0.000
Moderating Effect -> Tourist Satisfaction (Z1)	0.108	0.101	0.046	2.347	0.019
Tourist Satisfaction (Z1) -> Tourist Destination Loyalty (Y)	0.678	0.680	0.053	12.902	0.000

Source: Data analysis (2024).

### 5. CONCLUSION

# 5.1. Conclusions and Implications

Technology intelligence itself is a concept for understanding how much and how quickly visitors are able to use and utilize technology that has been prepared by tourism sites. The existence of smart technology as a transformation can have a strong influence on the experience quality felt and experienced by visitors on satisfaction. The behavior shown by visitors is an illustration of what they receive when they are at a tourist site. Overall, visitors with different educational backgrounds and ages are influenced by the ability to share moments when visiting tourist attractions. The results of the research show that there are several critical implications that businesses related to tourism places must ensure the comfort of the place not only from the internal side but also from the external side, and they underline the importance of smart technologies.

There is a positive influence from all direct hypotheses where experience quality has a significant positive influence on destination loyalty. Experience quality has a significant positive influence on tourist satisfaction where it has the largest coefficient value compared to the direct influence test. Tourist satisfaction has a positive influence on destination loyalty, and the influence test has no direct correlation with smart tourism technologies, which moderate a significant positive influence on experience quality and tourist satisfaction.

## 5.2. Theoretical Contributions

This article contributes to the various theories used, the first of which describes the basic literature in the form of visitor behavior in a model concept in the form of smart technology, which in this case is technology, which includes a broad definition based on aspects that are in accordance with this research, there is experience quality which covers the quality of the experience felt by visitors, there is tourist satisfaction where visitors feel happy and all the efforts obtained are in accordance with what is spent or there is a satisfaction that is included in a fairly large area and finally there is the desire of visitors to share various parties and there is a great desire to visit again (tourist destination loyalty).

Some theories can be expanded, namely the theory of experience quality, tourist satisfaction, smart technologies tourism, and the existence of destination loyalty, which in this case is closely related to behavioral theory. Behavior is a theory that explains people's activities regarding what they will do, which is related to the existence of an exchange and the use of a system. The existence of social exchange theory (SET) and the technology acceptance model (TAM) are the basis for the development of this research model and provide support for the theory used.

# 5.3. Managerial Contributions

This contribution suggests that smart technology has an important role in the success of tourism site managers. It can be said that the development of a changing and uncertain environment requires a change in managing tourism sites, which in this case requires the utilization and use of technology. Technology is able to answer the challenges of changes in the existing environment. Technology helps visitors freely enjoy the various facilities provided at tourist attractions. As a main point for

policymakers managing tourism sites, visitors are an asset that must be served well and correctly with the help of smart technology.

#### 5.4. Research Limitations and Further Research

This research has limitations, which include the existence of concepts from various perspectives related to smart destinations, which are supported by the existence of an institutional plan, emphasizing the possibilities offered by ICTs so that it will become sustainable, accessible or innovative that makes tourism easier (López de Ávila and Garcia, 2013); the existence of a smart tourist context; This paper has described a phenomenon that is currently developing so that smart technologies tourism can be considered as its own market segment according to Dolnicar and Matus (2008). Future research needs broader empirical support to strengthen validity, better understand tourists and their use, and develop a more critical approach related to smart tourism technologies.

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