

# TECHNOLOGY READINESS AND CUSTOMER SATISFACTION IN LUXURY HOTELS: A CASE STUDY OF VIETNAM

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## ABSTRACT

*Today's technology revolution 4.0 is taking place at a rapid pace. A wide range of advanced technology applications have been deployed in various sectors such as banking, healthcare, insurance, retail, transportation, and so on. The hotel industry is no exception. Self-service technologies are changing business processes in hotels. By adopting and deploying self-service technologies, hotels are expected to improve their service quality and customer satisfaction. However, in practice, customers have differences in technology readiness and such differences may affect customer satisfaction with the hotel. Up to now, no research has examined the direct relationship between customer technology readiness and satisfaction with luxury hotels in Vietnam - a newly emerging country with many economic achievements. This research aims to fill this gap. The results showed that among four factors of the construct "technology readiness", optimism and innovativeness are positively related to visitor satisfaction with the luxury hotel. Meanwhile, there is no statistical evidence that discomfort and insecurity affect visitor satisfaction with the luxury hotel. Implications, limitations, and future research are discussed.*

**Keywords:** Technology Readiness, Customer Satisfaction, Luxury Hotel, Vietnam.

## INTRODUCTION

Today, we are living in the era of the 4.0 technology revolution with a wide variety of technology applications in various industries, such as banking, healthcare, retail, transportation, and so on (Ostrowski, 2010). The hotel industry is not an exception. Transactions driven by self-service technologies in hotels are becoming more common. In the hotel industry, self-service technologies allow customers to engage in the creation and delivery of services without the direct involvement of hotel staff. In other words, self-service technologies are changing the business processes of the hotel industry (Lui and Picolli, 2010). In the past, with the traditional processes in the creation and delivery of services, many customers were dissatisfied with their service encounter for a variety of reasons. For example, hotel staff was unskilled and inexperienced in serving customers; customers must wait long for their service; or customers needed to be served at times when the hotel's facilities were not operating. Through the application and acceptance of

self-service technologies, hotels can overcome these limitations to provide the best service experiences for their customers (Watkins, 2009).

Self-service technologies in hotels are numerous with a variety of functional options, depending on the business purposes of hotels. In general, there are four types of self-service technology interfaces: telephone-based technologies or interactive voice response systems; technologies based on Internet connection; interactive kiosks; and image (video)-based technologies. The four types of technology interfaces are focused on customer services with the goal of helping customer's complete transactions and gain a good experience with hotel services (Mayock, 2010).

Self-service technologies in hotels can bring benefits for both the hotel and the guest. For hotels, self-service technologies help overcome challenges from the shortage of skilled and experienced hotel staff in serving customers. Self-service technologies can undertake certain functions in place of hotel staff who directly serve customers, and help customers directly engage in their service experiences. Self-service technologies can help hotels further enhance their service quality standards to meet or exceed customer service expectations and make customers more satisfied with the hotels. Finally, self-service technologies help hotels increase operational efficiency, cut unnecessary costs, and make favorable conditions for increased profitability and sustainable development (Beatson et al., 2007).

For customers, self-service technologies enable them to engage more directly in processes of service creation and delivery in order to have better service experience. In addition, cost savings, reduced service times and better control of service delivery will help customers become more enjoyable with customized services (Gelbrich, 2009).

There have been a number of research studies on technology acceptance in general and self-service technology acceptance in particular. These works mainly use models or theories such as Theory of Reasoned Action, Theory of Planned Behavior, Decomposed Theory of Planned Behavior, Technology Acceptance Model, Diffusion of Innovation, just to name a few, to explain and anticipate adoption and use of new technologies. However, these theories and models primarily focus on perceived ease of use and benefits of new technologies to predict the acceptability of users of these technologies, but ignore the differences of individuals, especially their technology readiness. Technology readiness reflects the customer's emotions about self-service technologies and can affect how customers will use these technologies and how satisfied they are with the hotel. Customers with differences in their technology readiness may have different satisfaction or dissatisfaction with the hotel, and this issue needs to be clarified by an empirical study.

In addition, previous studies have been conducted mainly in developed countries, with little or no progress being made in Vietnam-an emerging country with an impressive GDP growth rate of 6.8% in 2017 (General Statics Office of Vietnam, 2017). Vietnam has achieved many economic achievements since its implementation of economic reforms in 1986 (Pham et al., 2011). One of the achievements is the high growth rate of Vietnam's tourism industry. According to General Statics Office of Vietnam (2017), Vietnam's tourism industry has attracted 12.9 million international visitors and 73 million domestic visitors by 2017 and this trend will continue to increase in the future. Tourism is identified as one of the key sectors of the Vietnamese economy and is expected to generate revenues of around \$35 billion by 2020

(Politburo, 2017). Currently, Vietnam has 116 five-star hotels and 260 four-star hotels and 488 three-star hotels. The number of rooms in the five-star hotels is about 35,000; 34,000 for four-star hotels; and 34,000 for three-star hotels. These hotels are being step by step modernized with the deployment of many self-service technologies to meet the diverse needs of visitors during their stay (General Statistics Office of Vietnam, 2017).

The objective of this study is to investigate individual differences in technology readiness of international visitors during their stay in luxury hotels in Vietnam. In particular, this study will explore what components technology readiness is made of and if each of these components will influence visitors' satisfaction or dissatisfaction with the hotels during their stay.

## **THEORETICAL BACKGROUND**

### **Types of Self-service Technology in Hotels**

Nowadays, there are many self-service technologies with diverse options of functions implemented in hotels. Self-service technologies allow customers to engage more directly in the creation and delivery of services, and help customers have more enjoyable service experiences. One of the most popular self-service technologies deployed in hotels is self-service kiosks. Self-service kiosks were first deployed in hotels around the world in the late 1990s, but this implementation did not deliver the desired results (Mayock, 2010). There are many reasons for this failure; for example, installed software and self-service kiosks interfaces were complex or to put it another way, customers did feel that the use of self-service kiosks was not simple. The second reason may be that the location of self-service kiosks was not convenient for the customers to use. The third reason is that many customers were not technologically ready to switch from interacting with hotel staff to using self-service kiosks. The final reason is that for some customers, the waiting time to finish the transactions from self-service kiosks was longer than the time of interaction with the hotel staff. The failure from the deployment of self-service kiosks is a profound lesson for hotels as well as for manufacturers and providers of self-service kiosks. In the early 2000s, on the basis of the experience of failing to implement self-service kiosks in the past, the popularity of self-service kiosks in the airline industry (customers have become familiar with and used self-service kiosks), technological advances, many hotels have installed self-service kiosks and have had a certain level of success (Mayock, 2010).

With advances in technology, hotels have integrated many useful functions into self-service kiosks. Hotels are also becoming more sophisticated as they initially still maintain their existing traditional service channels besides self-service kiosks. There are two services provided by self-service kiosks that are commonly accepted: check-in and check-out applications. Other services include printing restaurant coupons in hotels or printing boarding passes when checking out. In general, the services provided by self-service kiosks are numerous, depending on the business purposes of the hotels (Ostrowski, 2010).

In addition to self-service kiosks, self-services based on the internet are offering a wide range of options for customers. Today's customers are able to interact directly with hotels to search for information, ask questions, or communicate with service staff via email or forums. Through the internet, hotels can interact and meet customer service needs without the constraints

of time and space. For example, more and more hotels are taking advantage of the internet to effectively deploy marketing programs or provide customized products and services for customers (Lui and Picolli, 2010).

Many studies have emphasized some of the attributes required for the hotel's website to satisfy customer needs for searching for reservation information as well as information about other facilities when visiting the website. Because there are no direct human-related interactions on the internet, hotel website users will determine their own satisfaction based on the quality and amount of information available on the hotel website (Schetzina, 2010).

It should also be noted that today's mobile technologies are becoming very popular and facilitating mobile interactions based on 3G and 4G networks. The significant increase in the use of mobile devices (for example, mobile phones) has contributed to the growth of mobile commerce. The hospitality industry has recognized the important role mobile commerce plays in enhancing service experiences for customers. More and more hotels are using the mobile environment to create and deliver services to customers. For example, customers can use their smartphone to check in, check out, book a restaurant table, or print boarding passes when checking out from the hotel (Kumar, 2010).

In addition to the self-service technologies mentioned above, other self-service technologies such as telephone-based technologies and interactive voice-based response systems are also widely deployed in hotels in order to provide services to visitors, help visitors complete transactions related to the hotel. However, in order to be successful in deploying self-service technologies, hotels need to study factors that can affect the level of customer satisfaction and one of these factors is technology readiness of visitors.

### **Technology Readiness (TR)**

According to Parasuraman (2000), technology readiness refers to people's propensity to embrace and use new technologies for accomplishing goals in home life and at work. Technology readiness represents a gestalt of mental motivators and inhibitors that collectively determine a person's predisposition to use new technologies (Parasuraman 2000). The construct consists of four distinct dimensions such as:

**Optimism:** A positive belief about technology to enhance control, flexibility, and efficiency.

**Innovativeness:** A predisposition to be a technology pioneer and thought leader.

**Discomfort:** A recognized lack of control over technology and a sense of being overwhelmed by it.

**Insecurity:** A suspicion of technology and skepticism about its ability to work properly. Parasuraman (2000) has indicated that optimism and innovativeness are positive drivers of technology readiness while discomfort and insecurity are negative attitudes towards technology. With respect to the interactions between customers and technologies, previous studies have confirmed that customers with a positive perspective felt that they would be receptive to technology products and services. In contrast, customers with a negative perspective felt that they would be resistant to technology products and services. So, technology readiness can positively distress customers' attitude and behaviour in technology adoption. Customers who

have high technology optimism would look at the product's technological features and consider them as more important than customers who have low technology optimism.

The instrument to measure and evaluate customers' technology readiness is the TRI scale with 36-items that was invented by Parasuraman (2000). This measurement scale consists of four dimensions: optimism, innovativeness, insecurity and discomfort. Previous studies have used this TRI scale in different contexts; for example, online insurance (Taylor et al., 2002), human resources (Walczuch et al., 2007), mobile data services (Massey, 2007), bank (Chen and Chen, 2009), education (Badri et al., 2014), and tourism (Wang et al., 2017). However, technologies have been changing overtime and new advances in technologies lead to the development of technology readiness index 2.0 (TRI 2.0) (Parasuraman et al., 2014). Compared to the TRI 1.0 scale, the TRI 2.0 scale is more condensed and consists of four factors with each factor including 4 items.

### **Satisfaction**

Satisfaction is described as an evaluation of emotion, suggesting that it reflects the degree to which a consumer believes that the possession and/or use of a service evoke positive feelings (Cronin et al., 2000; Rust and Zahorik, 1993). Zeithaml et al. (2009) define customer satisfaction as the customer's evaluation of a product or service, in which the product or service has met the client requirements, needs and expectations (Carragher & Parnell, 2008). However, if the evaluation of a product or service has not met the needs and expectations of the customer, it will probably result in customer dissatisfaction. Customer satisfaction is based on feelings and attitudes that a customer experiences with an organisation or brand (Hill et al., 2007).

With the recent technology development tendency, satisfaction can be considered as the sum of feelings resulting from users' beliefs regarding the extent to which a technology meets customer requirements (Chakrabarty et al., 2007). A satisfied customer is more likely to spend more money, stay longer with the business and recommend it positively to others (Babin et al., 2005; Lee et al., 2008).

There were some previous studies on the relationship between technology readiness and satisfaction. Lin and Hsieh (2007) and Meuter et al. (2003) confirmed that there is a correlation between technology anxiety and satisfaction in self-service technologies. The higher a customer's technology readiness is, the higher the customer satisfaction will be when using self-service technologies (Lin and Hsieh, 2007).

Our research study differs significantly from previous research studies. Specifically, we use the revised technology readiness index 2.0 (TRI 2.0) by Parasuraman and Colby (2014) to investigate the relationship between customer technology readiness and satisfaction with luxury hotels in a new research setting-Vietnam where previous research is scarce.

### **Studies on Technology Readiness**

Acceptance or adoption behavior towards a new technology or an innovation has been a research subject for researchers in the past few decades. Today, along with remarkable advances in technology, the focus has been placed on self-service technologies in not only the traditional business environment, but also in the online business environment (Gelderman et al., 2011; Kaur

and Gupta, 2012; Lilajander et al., 2006). Numerous studies have been conducted to pinpoint factors influencing adoption behaviors toward the Internet, e-commerce, mobile devices, e-banking, and e-trading (Bai et al., 2008; Chang and Kannan, 2006; Chen et al., 2013; Curran et al., 2003; Gefen and Straub, 2000; Meuter et al., 2005; Moon and Kim, 2001; Pham and Doan, 2014; Pham and Phan, 2016; Pham and Le, 2016; Sophonthummapharn and Tesar, 2007; Wang et al., 2015; Wolfinbarger and Gilly, 2001). Several studies have also incorporated the concept of technology readiness into technology adoption models, such as unified theory of acceptance and use of technology (UTAUT) (Helena et al., 2010), technology acceptance model (TAM) (Lin et al., 2007; Walczuch et al., 2007), and expectation-conformation model (Chen et al., 2013).

Some of the above-mentioned factors include service quality, perceived use of use, perceived usefulness, innovativeness characteristics and individual differences that can have impacts on adoption and acceptance of self-service technologies. It can be said that each of these factors has its own contribution to explaining acceptance and adoption behaviors for technologies in general and for self-service technologies in particular, and we cannot show a complete list of all these factors in this study. Instead, we focus only on a number of studies that used variables of individual differences and technology to explain an adoption (acceptance) behavior of a new technology or innovation.

Technology readiness may be a factor that can either hinder or inhibit the acceptance of a new technology. According to Parasuraman (2000), technology readiness refers to people's propensity to embrace and use new technologies for accomplishing goals in home life and at work. Technology readiness represents a gestalt of mental motivators and inhibitors that collectively determine a person's predisposition to use new technologies (Parasuraman 2000). The construct consists of four distinct dimensions such as:

**Optimism:** A positive belief about technology to enhance control, flexibility, and efficiency.

**Innovativeness:** a predisposition to be a technology pioneer and thought leader.

**Discomfort:** A recognized lack of control over technology and a sense of being overwhelmed by it.

**Insecurity:** A suspicion of technology and skepticism about its ability to work properly

Parasuraman (2000) has indicated that optimism and innovativeness are positive drivers of technology readiness while discomfort and insecurity are negative attitudes towards technology. Discomfort refers to a perceived lack of control and a feeling of being overwhelmed by technology. Such perceived lack of control and feeling of being overwhelmed by technology can create anxiety with technology. In a study of the relationship between technology anxiety and acceptance of self-service technologies, Meuter et al. (2003) argued that technology anxiety had a negative impact on technology experience and reduced the possibility of accepting self-service technologies. Similarly, Compeau et al. (1999) found that a perceived anxiety of computers reduced the use of computers. Susskind (2004) pointed out that cynicism of the internet was negatively related to the degree of time spent online. Despite the high correlation between technology discomfort and anxiety, Meuter et al. (2003) suggested that these two factors were two distinct factors. Dabholkar and Bagozzi (2002) argued that anxiety can lead to a lack of control and in turn, this lack of control can lead to discomfort.

Insecurity refers to the lack of trust in technology and the technology's ability to function properly. Insecurity is considered one of the most important factors leading to the non-use and unacceptance of e-commerce (Pham and Le, 2016). Insecurity also leads to negative perceived benefits (Sophonthummapharn and Tesar, 2007). Pham and Doan (2014) argued that there is a positive relationship between trust and perceived benefits in the e-banking environment, and in turn, these expected benefits will lead to adoption of e-banking. If customers do not feel secure in the e-banking environment, the level of expected benefit realization will slow, leading to an increased resistance to e-banking.

Optimism refers to a positive view in technology, including a belief of control, flexibility, convenience and efficiency (Parasuraman et al., 2000). It is important for customers when they feel they can control self-service technologies (Lu et al., 2012). Convenience is always a major benefit from the use of self-service technologies, such as e-banking (Pham and Doan, 2014).

Innovativeness is the tendency to become a technological pioneer (Parasuraman, 2000). Among the factors constituting technology readiness, innovativeness has been most investigated in previous studies. Innovativeness is an important factor that is positively related to acceptance of a technology (Goldsmith et al., 1998). Besides studies showing a positive relationship between innovativeness and acceptance of a new technology, other studies did not find empirical evidence for this relationship (Hui and Wan, 2004; Roehrich, 2004).

Parasuraman (2000) encouraged future studies to examine the relationships among antecedents and outcomes of technology readiness. However, few studies of this kind have been published. Tsikriktsis (2004) repeated Parasuraman (2000)'s study via collecting data from English consumers. The findings of this study supported that of Parasuraman (2000)-4 factors measuring technology readiness. Taylor et al. (2002) tested the TR scale for insurance agents. The authors found support for the validity of optimism and innovativeness, but no support for the validity of insecurity and discomfort. Yi and Hwang (2003) conducted a study on college students' acceptance with online learning systems. However, the authors indicated that the TR scale did not have high reliability, especially the factor of discomfort (excluded from the analysis).

Liljander et al. (2006) studied the effects of the TR construct on customers' attitudes and adoption towards using SSTs for airline check-in. The results indicated that only optimism and innovativeness established unique dimensions. In addition, they found that TR had very small impacts on customer attitude and adoption behavior towards using SSTs for airline check-in. Lin et al. (2007) integrated the TR construct into the TAM model. The results showed that TR had indirect impacts on consumer adoption of e-service systems via the mediating variables of perceived ease of use and perceived usefulness.

Chen and Li (2010) integrated the TR construct into the theory of planned behavior model and found out that technology readiness had significant effects on attitude, subjective norms, and perceived behavioral control. In other words, technology readiness had indirect impacts on e-service systems via the mediating variables of attitude, subjective norms, and perceived behavioral control.

Chen et al. (2014) investigated the relationships among technology readiness, relationship quality, and continuance intention in the setting of an e-appointment system. The findings showed that optimism and innovativeness were statistically significantly related to continuance

intention to use the e-appointment system. However, discomfort and insecurity did not have influences on continuance intention to use the e-appointment system. Hallikainen and Laukkanen (2016) explored the relationship between technology readiness and acceptance of digital services in B2B healthcare sector. The authors found that technology readiness explained acceptance of digital services to a lesser extent than expected.

Continuous changes in technology and rapid development of new technologies have led to a re-evaluation of the TR1.0 scale and generated the TR2.0 scale (Parasuraman and Colby, 2014). However, up to now, to our best knowledge, no study has used the TR 2.0 scale to study its impacts on customer satisfaction. Moreover, no study has been conducted in Vietnam – a country characterized by a newly emerging economy with high economic growth and great tourism potentials. Therefore, the objective of this study is to fill this research gap. Below, we will develop hypotheses for our study.

## Hypotheses

According to Parasuraman (2000), technology readiness is a multi-factor construct, including factors that promote the acceptance of technology use and factors that hinder the acceptance of technology. Motivators include optimism and innovativeness. Inhibitors include discomfort and insecurity. Optimism refers to a positive view of technology and a belief that technology can bring about increased control, flexibility and efficiency for people in their office and at their home. Optimism will help people have increased control, trust in technology, perceived ease of use and perceived usefulness (Johnson et al., 2008; Lu et al., 2012; Wang et al., 2014). Optimistic people always believe that technology gives them a lot of value and useful functions to finish their work in companies and their tasks at home in the most effective way (Parasuraman, 2000). Optimism is positively related to satisfaction (Lin and Hsieh, 2007; Thong et al., 2006). Thus, the following hypothesis is proposed:

*H1: Optimism has a positive influence on customer satisfaction with luxury hotels in Vietnam.*

Innovativeness represents a person's tendency to become a technological pioneer and thought leader in adoption and acceptance of new technologies (Parasuraman, 2000). Innovative people are curious about new technologies and feel that they have the ability to use new technologies and handle uncertainties that technology can bring about. Innovative people see the technology functions positively (Lu et al., 2012). The closer they are to new technologies, the more useful they view new technologies (Walczuch et al., 2007). Studies have also pointed out the positive relationship between innovativeness and customer experience and technology acceptance (Kang and Gretzel, 2012). Hotels are embracing technological innovations to achieve cost savings, increased speed, product flexibility, and increased profitability. This move is consistent with innovative people' goals. Research has shown that there is a positive relationship between innovativeness and satisfaction (Wang et al., 2017). Thus, the following hypothesis is proposed:

*H2: Innovativeness has a positive influence on customer satisfaction with luxury hotels in Vietnam.*



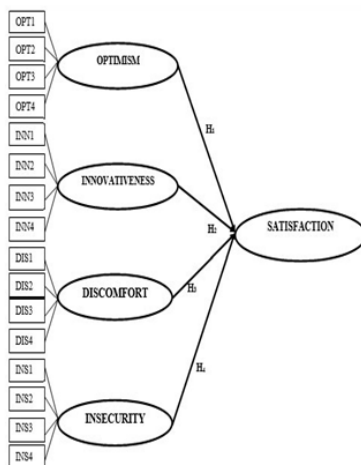
Discomfort refers to the lack of control over technology and a sense of being overwhelmed by technology (Parasuraman, 2000). People with high scores of discomfort often find technology complex and they feel anxious when using technology (Giebelhausen et al., 2014). The feeling of losing control will reduce the ability to handle uncertainties that technology can bring about (Lu et al., 2012). In addition, discomfort can lead to distrust of technology and, ultimately, to dissatisfaction (Lee and Wu, 2011). Thus, the following hypothesis is proposed:

*H3: Discomfort has a negative influence on customer satisfaction with luxury hotels in Vietnam*

Insecurity can be defined as a lack of trust in technology and pessimism about the true capacity of technology to function precisely (Parasuraman, 2000). Those who feel technologically insecure also experience high levels of anxiety when using new technologies and become pessimistic about the usefulness of new technologies (Lu et al., 2012). Insecurity can lead to a lack of trust in new technology as well as a sense that the technology functions are not useful (Johnson et al., 2008). Insecurity that arises from the unsafe environment can make customers dissatisfied (Lin and Hsieh, 2007). Thus, the following hypothesis is proposed:

*H4: Insecurity has a negative influence on customer satisfaction with luxury hotels in Vietnam*

It should be noted that TRI 2.0 consists of four factors and each factor has 4 items. So, the following model is our research model that illustrates the 4 hypotheses and the specific structure of TRI 2.0.



**FIGURE 1  
RESEARCH MODEL**

**METHODS**

## Research Setting

With a land strip connecting famous sea bays, the port image has been formed over 100 years, with attractive and diversified tourist resources, friendly and hospitable people, a convenient business environment with special caring of the local government, Khanh Hoa's tourism industry has developed remarkably over the years. Moreover, Khanh Hoa is one of the provinces with many high quality accommodation facilities on Southeast Asia's tourist map and is one of three provinces with the largest number of hotels in Vietnam. According to a report of Khanh Hoa's Tourism Department, Khanh Hoa has 638 accommodation establishments with over 23,693 rooms, of which more than 20 are luxury hotels with over 6,796 rooms serving as favorable conditions to attract a large number of visitors. Khanh Hoa's tourism industry has seen impressive growth in the past years. The average tourist growth rate of Khanh Hoa Province is 15% per year. Indicators such as tourist turnover and number of visitors, especially international visitors, have increased from 15% to 20% per year.

## Measures of the Constructs

In this study, Parasuraman and Colby's (2014) technology readiness scale was used. This scale consists of four constructs: optimism, innovativeness, insecurity, and discomfort. Each construct consists of four items (observed variables). The level of customer satisfaction was measured by four items which were borrowed from Lin et al. (2007) and Makanyeza and Mumiriki (2016), and adapted to fit the hotel research environment. All items are based on the Likert scale of 5 levels from 1 to 5 where 1 represents "totally disagree" and 5 represents "totally agree".

These tentative scales were reviewed by five hotel managers who involved in the management of services driven by self-service technologies and five academicians whose expertise was involved in teaching and doing research on hotel and tourism management. All these managers and academicians were very good at English. Based on their feedback, some necessary adjustments have been made. Subsequently, the intended questionnaire was sent to a group of 20 tourists who came from English speaking countries for the review of the semantics and the wording of the questionnaire content. The results showed that the survey questionnaire was completely understandable by these visitors and no further adjustments were required.

The translation of the survey questionnaire into French, Russian and Chinese was conducted by a professional translation company which specialized in serving for travel agencies and hotels. Before the translation, the authors met directly with the translators to discuss about the research related contents and the measurement scale in order to help the translators have a focused picture and understand the research issues. The completion time of translation was 12 days. Each translation version corresponding to a specific language was sent to a group of 10 visitors who came from countries speaking the respective language. Feedback and suggestions from these international visitors helped to adjust the semantics and the ways of wording to make the survey questionnaire more complete and understandable.

## Data Collection

This study focused on visitors from many countries and stayed in luxury hotels in Khanh Hoa Province, Vietnam. The data collection through the questionnaires provided directly to visitors with the help from tour guides. Of the total questionnaires, 430 were returned, of which 368 were appropriate for subsequent statistical analyses. The time for data collection was from March 2017 to July 2017. Table 1 below summarizes the demographics of the respondents and indicates that the background of the respondents is diverse:

<b>Table 1 PROFILES OF THE SURVEY RESPONDENTS</b>			
Profile		Count and Proportion	
		Count	Proportion
Gender	Male	169	45.9
	Female	199	54.1
Sources of international tourists	Asian	221	60.1
	European	93	25.3
	American	27	7.3
	Australian	21	5.7
	African	6	1.6
Age group	Under 20	25	6.8
	20 – 30	95	25.8
	31 – 40	131	35.6
	41 – 50	64	17.4
	51 – 60	32	8.7
	Over 60	21	5.7
Education	High School	78	21.2
	College/University Bachelor's degrees	223	60.6
	Masters'/PhD degrees	67	18.2

Purpose of visit	Leisure and recreation	205	55.7
	Business	114	31
	Education/ training	23	6.3
	Others	26	7.1

### Statistical Analysis Techniques

Structural equation modeling was selected as the main research tool. In our study, we follow the two-step approach suggested by Bollen (1989) where the construct reliability must be assured to create a sound measurement model followed by fitting the structural model. For the measurement model, model adequacy is verified by “fit” between the sample covariance and the reproduced covariance from the causal model. Based on the two-step approach, the reliability of observed variables (indicators) would be carefully examined before fitting the structural model (Hair et al., 1998). SPSS 21.0 and AMOS 21.0 software were utilized in this study.

## RESULTS

### Reliability and Validity Analyses

In this study, we used Cronbach’s alpha as a criteria to investigate the measurement scale reliability. Reliability presents the indicators’ internal consistency where the indicators are supposed to measure a specific construct. According to Nunnally et al. (1994), a measurement scale is regarded as high reliability if its Cronbach’s alpha is more than 0.7 while regarded as low reliability if its Cronbach’s alpha is less than 0.7.

The TRI 2.0 scale consists of four constructs: optimism (OPT), innovativeness (INN), discomfort (DIS) and insecurity (INS). Each constructs has 4 items (observed variables). Results of the TRI 2.0 evaluation showed acceptable Cronbach's alpha coefficients. Specifically, Cronbach's alpha of OPT=0.810, INN=0.808, DIS=0.822, and INS=0.805. Each was greater than 0.7. The correlation coefficients between each construct and its individual components are greater than 0.3. As for customer satisfaction with hotel (SAT), the results showed that the Cronbach's alpha coefficient is 0.809>0.7. The correlation coefficient between SAT and its individual components is greater than 0.3. Table 2 shows Cronbach’s alpha for each construct and factor loadings of all items on designated factors. In summary, the reliability of TRI 2.0 and SAT were satisfactory for further analysis. We applied a method suggested by Anderson and Gerbing (1988) - a two-step approach. More specifically, this method will investigate individual measurement models and then structural model. For the test of measurement model reliability and validity, the confirmatory factor analysis was conducted. The reliability test is done via examining the internal consistency of measurement items per variable.

<b>Table 2</b>					
<b>MEASURES OF VARIABLES OF INTEREST</b>					
<b>Measurements</b>	<b>Factor loadings</b>	<b>Corrected Item-to-total correlations</b>	<b>Eigenvalue</b>	<b>Variance explained</b>	<b>Cronbach's alpha</b>
Optimism			4.640	23.199	0.810
OPT1	0.716	0.546			
OPT2	0.789	0.683			
OPT3	0.791	0.652			
OPT4	0.782	0.655			
Innovativeness			2.788	13.940	0.808
INN1	0.821	0.673			
INN2	0.771	0.613			
INN3	0.769	0.607			
INN4	0.777	0.615			
Discomfort			2.100	10.499	0.822
DIS1	0.803	0.653			
DIS2	0.791	0.656			
DIS3	0.803	0.644			
DIS4	0.794	0.632			
Insecurity			1.993	9.967	0.805
INS1	0.797	0.625			
INS2	0.776	0.631			
INS3	0.787	0.631			
INS4	0.768	0.597			

Satisfaction					
SAT1	0.676	0.549	1.427	7.137	0.809
SAT2	0.800	0.665			
SAT3	0.795	0.652			
SAT4	0.817	0.639			

As a result, the composite reliability estimates of all factors were in a range of 0.806 and 0.823, indicating high reliability (Bagozzi and Yi, 1988). According to Peter (1981), construct validity refers to the extent to which a scale really measures a construct of interest. Construct validity consists of convergent validity and discriminant validity. Under the perspective of Anderson and Gerbing (1988), convergent validity examines the degree to which items that measure their respective construct are correlated. Hair et al. (2010) argue that the test of convergent validity is satisfied if values for factor loadings and average variance extracted (AVE) are greater than the cut-off level of 0.5. Table 3 indicates an acceptable convergent validity because all the factor loadings were in the range of 0.604 and 0.784, and all the AVE values were greater than 0.5. It should be noted that these values are statistically significant at the 0.001 level. Discriminant validity can be investigated via computing estimates for constructs' inter-correlations. In order to have satisfactory discriminant validity, correlations between two constructs (factors) should be less than 0.85 (Kline, 2005). Another way to check discriminant validity is to compare AVE values with squared inter-construct correlations, and if the squared inter-construct correlations are less than the AVE values, the discriminant validity might be considered as adequate. Table 3 shows that all the AVE values were smaller than 0.85, meaning the satisfactory level for discriminant validity of the measurement scales. Table 4 shows inter-construct correlations and squared root of AVE estimates.

### Structural Model and Hypotheses Testing

After the implementation of checking the reliability and validity of individual measurement models and having the satisfactory results, the fit of the overall model was evaluated based on running the techniques of SEM (structural equation modelling).

There is a number of model fit indices, namely, ratio of the chi-square to degree of freedom, comparative fit index (CFI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), and root mean square error of approximation (RMSEA), that must be taken into consideration.

<b>Table 3</b>				
<b>RELIABILITY AND VALIDITY OF MEASUREMENT MODELS</b>				
<b>Constructs</b>	<b>Measurements</b>	<b>Factor loadings</b>	<b>Cronbach's alpha (Reliability)</b>	<b>Average variance extracted (AVE)</b>
OPT	OPT1	0.604		
	OPT2	0.775		
	OPT3	0.754		
	OPT4	0.77	0.818	0.532
INN	INN1	0.784		
	INN2	0.695		
	INN3	0.704		
	INN4	0.691	0.811	0.518
DIS	DIS1	0.741		
	DIS2	0.754		
	DIS3	0.727		
	DIS4	0.709	0.823	0.537
INS	INS1	0.704		
	INS2	0.741		
	INS3	0.738		
	INS4	0.671	0.806	0.51
SAT	SAT1	0.632		
	SAT2	0.775		
	SAT3	0.746		
	SAT4	0.72	0.811	0.519

It should be noted that if the values for CFI, NFI, and GFI are more than 0.9; the value for AGFI is more than 0.8; the value for RMSEA is less than 0.08, the value for chi-square/degree of freedom is less than 5, then according to Hair et al. (2010), the model can be regarded as the satisfactory fit. Table 5 below indicates that there was an adequate fit between the data and the proposed model.

Variables	Mean	Standard deviation	OPT	INN	DIS	INS	SAT
OPT	3.88	0.91	0.532				
INN	3.77	1.06	0.267	0.518			
DIS	2.68	1.09	-0.238	-0.155	0.537		
INS	2.6	1.13	-0.322	-0.139	0.296	0.51	
SAT	3.69	1.07	0.485	0.305	-0.104	-0.062	0.519

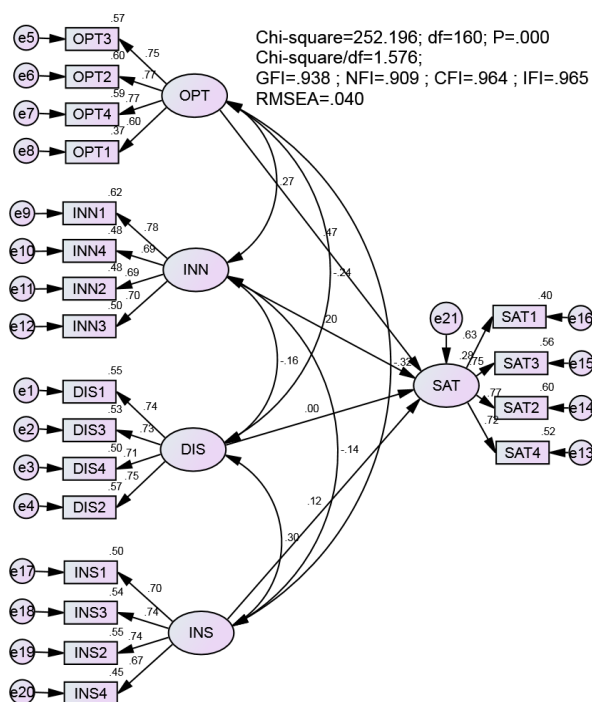
The standardized path coefficients are estimated and shown in Table 6. The relationship between optimism and satisfaction (Hypothesis 1) was statistically supported by the corresponding estimate of 0.593 ( $t=6.456$ ,  $p<0.01$ ). The standardized path coefficient from innovativeness to satisfaction (Hypothesis 2) was 0.175 ( $t=3.138$ ,  $p<0.01$ ), meaning that Hypothesis 2 was also statistically significant. This finding indicates that innovativeness is a significant predictor of satisfaction. The relationship between discomfort and satisfaction (Hypothesis 3) ( $t=0.074$ ,  $p>0.1$ ) and the relationship between insecurity and satisfaction (Hypothesis 4) ( $t=1.758$ ,  $p>0.05$ ) were not statistically supported.

Fit Statistics	Recommended value	Estimated value
Chi-square/df	$\leq 5$	1.576
GFI (goodness of Fit Index)	$\geq 0.90$	0.938
NFI (normalized fit index)	$\geq 0.90$	0.909
IFI (incremental fit index)	$\geq 0.90$	0.965
CFI (comperative Fit Index)	$\geq 0.90$	0.964
RMSEA (root mean square error of approximation)	$\leq 0.08$	0.04

Figure 2 below is the graphical presentation of hypotheses testing, where the specific relationships between each factor of the technology readiness construct and its items, and the specific relationships between each factor of the technology readiness construct and customer satisfaction.



Table 6							
THE RESULTS OF HYPOTHESES TESTING							
			Estimate	Standard error	t-value	p-value	Hypothesis Results
SAT	<---	OPT	0.593	0.092	6.456	0	H:Supported
SAT	<---	INN	0.175	0.056	3.138	0.002	H:Supported
SAT	<---	DIS	0.004	0.054	0.074	0.941	H:Not supported
SAT	<---	INS	0.107	0.061	1.758	0.079	H4:Not supported



**FIGURE 2**  
**RELATIONSHIP BETWEEN TECHNOLOGY READINESS AND SATISFACTION**

**DISCUSSION AND CONCLUSIONS**

Today’s technology revolution of 4.0 is taking place at a rapid pace. A wide range of advanced technology applications have been deployed in various sectors such as banking, healthcare, insurance, retail, transportation, and so on. The hotel industry is no exception. Self-service technologies are changing business processes in hotels. Previously, the creation and delivery of services to customers were primarily based on direct interactions between the hotel

staff and customers. In many situations, customers did feel unsatisfied with their service experience. There were several reasons for this. First of all, some hotel employees were not really skilled and experienced in serving customers. Second, customers sometimes must long wait for their services. Third, some customers wanted to be served at times when the hotel's facilities were not working. Through the adoption and deployment of self-service technologies, hotels can overcome these limitations to provide a better service experience for customers and increase customer satisfaction.

In general, there are many different types of self-service technologies with a variety of functional options for hotels, depending on their financial potential and business goals. Some typical self-service technologies deployed in hotels include telephone-based technologies or interactive voice response systems; technologies based on internet connection; interactive kiosks; and image (video) based technologies. The main focus of these self-service technologies is placed on customer services with the primary goal of helping customers complete their hotel transactions quickly and gain a better service experience when interacting with hotels.

The deployment of self-service technologies can bring tremendous benefits to both hotels and customers. For hotels, self-service technologies can help overcome the shortage of employees who are skilled and experienced in serving customers. Self-service technologies make favorable conditions for customers to be directly involved in the creation and delivery of services. Self-service technologies help improve operational efficiency and reduce unnecessary costs for hotels. Finally, self-service technologies can help hotels achieve targeted returns and sustainable growth.

For customers, with the help of self-service technologies, customers can directly participate in the process of creating and providing services for a better service experience. Customers have more opportunities to create their customized services. Time and cost savings for hotel-related transactions will result in higher customer satisfaction.

So far, research has focused on investigating the acceptance of new technologies in general and self-service technologies in hotels in particular through the use of Theory of Reasoned Action, Theory of Planned Behavior, Decomposed Theory of Planned Behavior, Technology Acceptance Model, Diffusion of Innovation, just to name a few to explain the acceptance and use of these technologies in different settings. However, very few studies have used Parasuraman and Colby's (2014) Technology Readiness 2.0 (TR 2.0) to assess the relationship between customer technology readiness and satisfaction with the hotel. Moreover, no research on this topic has been conducted in Vietnam - a newly emerging country with an economic growth rate of over 6.8% in 2017 (General Statistics Office of Vietnam, 2017). Vietnam has achieved a lot of economic achievements since its implementation of economic reforms in 1986. One of the economic achievements is the rapid development of Vietnam's tourism industry.

This research focuses on the relationship between customer technology readiness and satisfaction with luxury hotels in Vietnam. The results showed that optimism and innovativeness have a positive relationship with satisfaction with the hotel (Hypotheses 1 and 2 are supported). Meanwhile, discomfort and insecurity have no statistically significant impact on hotel satisfaction (Hypotheses 3 and 4 are not supported). This result is very important for hotels in their customer segmentation strategy. Specifically, for customers who are optimistic about

technology, they always have positive beliefs in technology (Johnson et al., 2008). They always argue that self-service technologies in hotels can bring a greater control, convenience, flexibility and efficiency in dealing with hotels (Wang et al., 2014). This group of customers always perceives that using self-service technologies is simple and beneficial for them (Lu et al., 2012). Therefore, hotels must concentrate their resources on investing in self-service technologies to generate higher customer satisfaction.

Technology innovativeness describes the tendency of an individual to become a leader in the adoption and use of new technologies (Parasuraman, 2000). This customer group with technology innovativeness is always curious and wants to explore new technologies (Lu et al., 2012). They always argue that they have the ability to use new technologies and are not afraid to face the risks that new technologies can bring about (Walczuch et al., 2007). Therefore, in order to improve the quality of services, to make customers more satisfied and more loyal, to make targeted profits and sustainable development, hotels must periodically carry out renovations by investing in modern technologies to meet this group of customers' needs for new technologies.

### **Theoretical and Practical Contributions**

We believe that this research has made significant contributions to the literature. First, Parasuraman and Colby (2014) refined TR1.0 to TR2.0. However, according to our best understanding, no studies have so far used TR2.0. This study can be considered one of the first studies to use TR2.0 to study the relationship between technology readiness and customer satisfaction. Second, previous studies used TR1.0 primarily to study the effects of technology readiness on acceptance and adoption behaviors towards technology. Few studies have looked at the relationship between technology readiness and customer satisfaction. Third, some studies used TR1.0 to study the relationship between technology readiness and satisfaction, but did not study the specific effects of each factor of technology readiness on satisfaction. Fourth, there is no study on the relationship between technology readiness and satisfaction, conducted in Vietnam - an emerging economy with high economic growth. This study could be considered as the first study to use TR2.0 in the Vietnamese research setting. We are confident that the results of this study have made a significant contribution to the literature and serve as a good guide for future similar studies in countries with emerging economies.

In practice, this study has significant contributions. First, this study indicates that optimism has a positive effect on customer satisfaction. This result is consistent with the expectation of Parasuraman (2000) and coincides with the results of Thong et al. (2006) and Lin and Hsieh. (2007). Optimism refers to a positive view of technology and a belief that technology can bring about increased control, flexibility and efficiency for people in their office and at their home. Optimism will help people have increased control, trust in technology, perceived ease of use, and perceived usefulness (Johnson et al., 2008; Lu et al., 2012; Wang et al., 2014). Optimistic people always believe that technology gives them a lot of value and useful functions to finish their work in companies and their tasks at home in the most effective way (Parasuraman, 2000).

Second, this study also indicates that innovativeness has a positive impact on customer satisfaction. This result is consistent with the expectation of Parasuraman's (2000) and coincides with the results of Wang et al. (2017). Innovativeness represents a person's tendency to become a technological pioneer and thought leader in adoption and acceptance of new technologies (Parasuraman, 2000). Innovative people are curious about new technologies and feel that they have the ability to use new technologies and handle uncertainties that technology can bring about. Innovative people see the technology functions positively (Lu et al., 2012). The closer they are to new technologies, the more useful they view new technologies (Walczuch et al., 2007). Studies have also pointed out the positive relationship between innovativeness and customer experience and technology acceptance (Kang and Gretzel, 2012). Hotels are embracing technological innovations to achieve cost savings, increased speed, product flexibility, and increased profitability. This move is consistent with innovative people's goals.

For optimistic and innovative customers, in order to make these customers satisfied, luxury hotels in Vietnam should adequately invest in self-service technologies. Investment in self-service technologies in hotels can bring benefits for both the hotel and the guest. For hotels, self-service technologies help overcome challenges from the shortage of skilled and experienced hotel staff in serving customers. Self-service technologies can undertake certain functions in place of hotel staff who directly serve customers, and help customers directly engage in their service experiences. Self-service technologies can help hotels further enhance their service quality standards to meet or exceed customer service expectations and make customers more satisfied with the hotels. Finally, self-service technologies help hotels increase operational efficiency, cut unnecessary costs, and make favorable conditions for increased profitability and sustainable development (Beatson et al., 2007). For customers, self-service technologies enable them to engage more directly in processes of service creation and delivery in order to have better service experience. In addition, cost savings, reduced service times and better control of service delivery will help customers become more enjoyable with customized services (Gelbrich, 2009). It should be noted that for customers who are uncomfortable with using self-service technologies, they are always out of control and overwhelmed by self-service technologies. In fact, they are not confident in manipulating self-service technologies in hotels. Perhaps, their knowledge about the use of computers and hotel equipment is limited, or they are not really familiar with the technology's operations to complete hotel-related transactions. For customers who feel insecure with self-service technologies, they really do not trust in self-service technologies. They argue that self-service technologies are risky; for example, the risks of incomplete hotel transactions; the risks related to the disclosure of personal information; and other financial risks. So, they really do not want to interact with self-service technologies in the hotel.

In this study, there is no statistical evidence that discomfort and insecurity have effects on visitor satisfaction with the hotel; however, the hotel needs a special attention paid to this customer group. Specifically, the hotel must maintain a skilled staff to interact directly with this customer group and help them complete hotel-related transactions. In addition, besides the deployment of self-service technologies, the hotel needs to publish detailed and clear instructions on how to use self-service technologies. With these guidelines, this group of customers can partially overcome their technology discomfort and insecurity, and might perceive the ease and

benefits when using self-service technologies. Doing so, customer satisfaction with the hotel might be generated.

### Limitations and Directions for Future Research

Although this study was conducted in Vietnam-a newly emerging country with many economic achievements since its introduction of economic reforms in 1986, including the rapid development of the tourism and hospitality industry. However, there are some limitations that need to be addressed. Firstly, the luxury hotels in the sample are only located in Khanh Hoa - a well-known tourist province of Vietnam, so the representativeness of this research is not high. Secondly, the study focuses only on the direct relationship between technology readiness and customer satisfaction. Thus, there might be other mediating variables between these two variables that need to be investigated. Future studies should overcome these limitations in order to achieve more representative and meaningful results.

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