The Effect of Interface Design and Perceived Risk of Customers' Satisfaction and Loyalty on Online Booking Application

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ABSTRACT

The vast increasing of online service applications has encouraged service providers to improve their service quality including in online booking applications. To understand the factors influencing e-purchase, scholars have found that interface design and perceived risk influence buying behavior including to book hotels or to make travel plans. This study aimed at evaluating correlation of interface design and perceived risk toward consumers' satisfaction and loyalty and assessing the relationship between demographic background and examined variables. The survey method using questionnaire was conducted in November 2017. The 387 valid questionnaires were analyzed to figure out the correlation among the variables by using Pearson correlation. This study found that interface design positively correlates with customer's satisfaction with moderate correlation coefficient (0.558). The perceived risk also significantly correlates negatively with satisfaction, and the coefficient correlation is weak (-0.204). For the relationship between satisfaction and loyalty, this study also found that consumers' satisfaction strongly correlates with consumers' loyalty (correlation coefficient is 0.640). Demographic factors show the significant differences on several tested variables such as the correlation between educational level and interface design; gender, educational level and age level toward perceived risk; and gender and education with satisfaction.

Keywords: Online Booking Applications; Interface Design; Perceived Risk; Customer Satisfaction; Customer Loyalty; Demographic Factors

Introduction

The rapid development of Internet has increased people's preferences to use internet to manage their needs such as using online booking applications for traveling and lodging. A number of online booking applications have been established to provide information and to make people to feel convenience when manage their travel plans. Various online travel booking services also compete each other to get orders and to increase customer satisfaction through increasing their service quality. Previous research has shown the factors that influencing consumers' intention to re-visit the website and re-purchased by online. Of many factors that have been evaluated by scholars, web design or interface design [1-3] and perceived risk [4-6] are the factors influencing the decision of consumers to browse and to make e-purchase deals from particular websites or applications including on online travel booking application. Interface is the part of computer system that allows users or browsers can interact [7]. Through combination of hardware and computer software, interface connects users to meet their needs. The interaction between human and computer system is different in most of the websites depending on the design of the interfaces. As an example, each website provides the different kind of buttons, symbols, pictures, and touch pads to be clicked in

the screen to show the next process or steps. Several criteria that important to be considered when design computer system including website page is easy to use, easy to learn, reduce harm, easy to get help, easy to check, easy to share in groups, and easy to integrate into existing systems [8]. The website programmers should design the appearance of the website and its interface to be interesting to attract the visitors and to satisfy them when searching of what they need. For online marketing, the interface design is a basic step of trading process because it is a media and tool to communicate with consumers both to offer and to make transaction. Hence, the good quality design of interface can attract consumers to purchase from the online vendors. Another factor that influence people to decide to make e-purchases is the availability of risk or perceived risk. Perceived risk is often associated with trust because these terms are related each other. Perceived risk in shopping can be defined as the possibility of loss [9].

Consumers perceive risks because they face uncertainty and adverse consequences on undesirable result of product or services purchases [10]. Considering the shopping method, online shopping is more risky compare to face to face interaction [11] because in online shopping, consumers cannot clearly see the goods like in the physical stores. The researches that studied the correlation of web design with e-purchase or online purchase have been done by scholar but the research relating interface design are still limited. The researches on the correlation of perceived risk with online shopping also have been conducted in previous studies. However, the researches that combined the interface design and perceived risk online purchase and correlated them to demographic background are still limited. Additionally, the specific topic of the studies on the service purchase particularly in hospitality and travel reservation are still not much assessed. Hence, this study intended to examine correlation of the online booking interface design and perceived risk toward consumers' satisfaction and loyalty. This study purpose also was to examine correlation of demographic background with the perception on interface design, perceived risk, and loyalty on online booking.

Research methods

Sampling and Data Collection

The respondents in this research were Taiwanese consumers who ever used online booking application by Internet. They are who have credit or debit card used to process online transactions. The data collection was conducted by online survey through sending questionnaires by Facebook and Line applications. The data collection was carried out from December 1, 2019 to January 31, 2020. The number of samples was 387 samples. The respondents were categorized based on gender (F= 197; M=190), educational level (junior-senior high school=36; bachelor=235; master or above/research work=116), and age (< 30 years old=49; 30-39 years old= 159, 40-49 years old=125; 50-59 years old=54).

Research Hypotheses

The purpose of this research was to understand the relationship between interface design, perceived risk, customer satisfaction, and customer loyalty on online booking reservation. A previous research conducted by (Ludin et al. [1,2]) studying web design and customer satisfaction mentioned that the information quality and system quality of the portal or website the most important way to obtain customer satisfaction. It is because the quality of the interface affects consumer acceptance, which means that if the information provided in the interface good, the satisfaction of the consumers also good. The complete and interesting appearance (buttons, colors, images, formats, charts, and etc.) and the easiness to use of interface will increase customer satisfaction [12-14]. Hence, from these findings, we developed the hypothesis, i.e. hypothesis 1: There is a positive correlation between interface design of online reservation applications and consumers' satisfaction. Although e-commerce shopping system provides a number of benefits to customers, online shopping and online transaction also have risks. (Crespo et al. [4]) argued that perceived risk can decrease the consumption behavior. (Mattila [15]) pointed out the relationship between the perceived risk of business travels and consumption behavior after purchasing is contradictory, which mean that perceived risk level has negative impact on the level of customers' satisfaction. For online booking, (Swaminathan, et al. [16]) stated that if the transaction is not safe, the perceived risk will increase and the importance of online transactions will also decrease. Hence, from those statements, the following hypothesis developed in this study was: hypothesis 2: there is a negative correlation between consumers' perceived risks on online reservation and consumers' satisfaction. According to the research of customer satisfaction and loyalty, (Anderson, et al. [17]) found that customer loyalty (purchase) is closely related to product intention. (Reichheld, et al.[18]) pointed out that customer satisfaction can lead to increase customer loyalty, and satisfaction will increase their consumption. (Elkhani [19]) conducting a research on ticket reservations found that overall customer satisfaction has a significant positive impact on loyalty. Therefore, the last hypothesis of this study was: hypothesis 3: there is a positive correlation between consumers' satisfaction and consumers' satisfaction on online reservation.

Data Analysis

The questionnaire consisted of a number of question items that related to the interface design (17 questions), perceived risk on online booking applications (11 questions), consumers' satisfaction (10 questions), and consumers' loyalty (7 questions) as they are provided in Table 1. The answers provided for each question and statement consisted of five level scales, starting from lowest level until to the highest level. As an example, for question A (1) "Interface layout makes the application easily to be operated" and the provided answer was

(1) Unimportant;

(2) Rather important;

(3) Neutral;

(4) Important; and

(5) Very important.

At the end of the questions of four variables, the respondents were asked about their opinion to confirm the importance of design interface, the availability of perceived risk, the satisfaction on the overall online booking application, and their loyalty on online booking application. For this type of question, the available answers were binomial, i.e: yes (1) or no (2). This research used

quantitative approach, and all the answers were quantified the respondents' answer with 5-level Likerts' scale. The data were later used to examine the hypotheses. The analysis applied to evaluate the correlation of each variable was Pearson's correlation. For this analysis, the data gained from the lists of questions with 5-level Likerts' scale answer were used to examine the correlations (hypotheses). While to evaluate the significance of different demographic backgrounds toward four observed variables, this study used cross tabulation and Chi-square analysis. For this purpose, the yes/no questions provided in the end of each variable in the questionnaire were used to evaluate the significance. This study used the SPSS 25.0 version software as a tool to analysis the data (Figure 1).
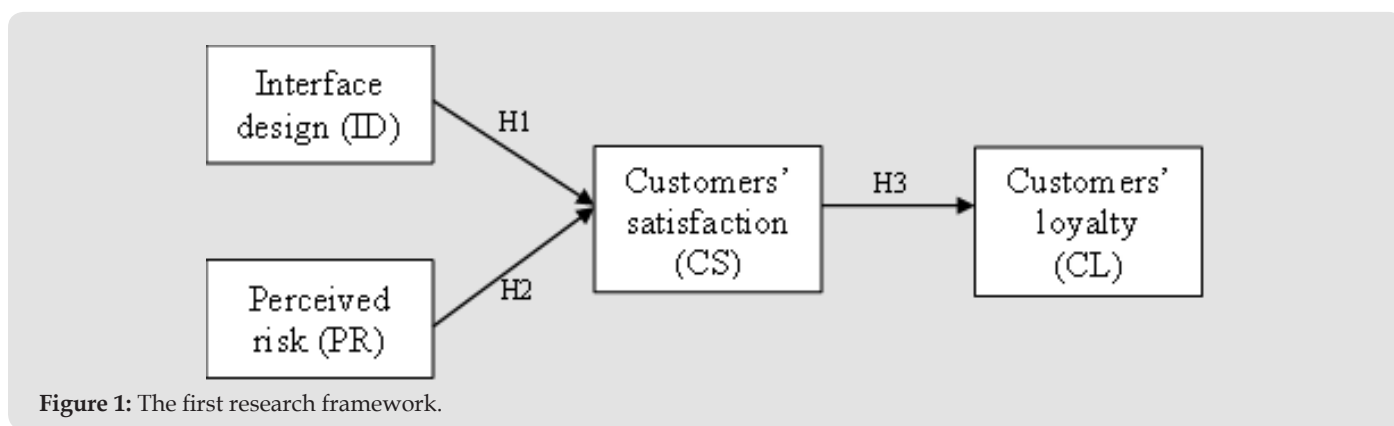

Figure 1: The first research framework.

Results and Discussion

Result

Calculation of Cronbach's alpha values was conducted to assess the reliability or consistency of the data. Theoretically, the result of Cronbach's alpha should give a number from 0 to 1, but it also can be negative numbers. If the Cronbach's Alpha value between 0.50 and 0.70, the data have the standard reliability, and if the Cronbach's Alpha value between 0.70 and 0.90, the data have a high reliability. If the Cronbach's Alpha value is higher than 0.90, it is a

very high reliability. For this present study, reliability test result is provided in (Table 1). The reliability test shows that the Cronbach's Alpha values are 0.887 for interface design variable and 0.897 for perceived risk, which mean that the reliability of the data of each variable is high. While for costumers' satisfaction and loyalty, the Cronbach's Alpha values are very high, which they are 0.945 for satisfaction and 0.943 loyalty, respectively. From this result, the further analysis can be continued because the existence and quality of the data are reliable.

Table 1: Goodness of fit and reliability test of criteria of each variable.

Variables	Items		Cronbach's Alpha
Interface design	1.	Interface layout makes the application easily to be operated	0.887
	2.	Interface design makes the application easily to be remembered	
	3.	Interface images and videos allow me to quickly understand the room type	
	4.	Interface design helps me to solve errors quickly when I do reservation	

Interface design	5.	Interface colors should be coordinated and matched appropriately	
	6.	Shortcuts in interface is important to be provided to reduce time searching	
	7.	The function of going back to the previous step in the interface is important to be provided to increase the convenience.	
	8.	The clear and obvious images used in the interface are important.	
	9.	The text in the interface is important to be easy to read.	
	10.	The notification should be provided in interface when reservation process is over	
	11.	Only few clicks to complete the reservation is important in the interface design	
	12.	Question and answer (QA) service is important to be provided in the application	
	13.	Integrated interface design is important	
	14.	The introduction of the room type in the interface should be matched to the actual situation	
	15.	The font size, type, and number in the interface should be comfortable to be read.	
	16.	The design style of booking interface should be consistent	
	17.	The interface design should provide options to meet individual needs (such as: time, room type, price)	
Perceived Risk	1.	I am worried that my personal transaction information will be leaked after making online booking	0.897
	2.	I am worried that my credit card information cannot be kept confidential after making online booking	
	3.	I am worried that hackers will steal my personal data making online booking	
	4.	I am worried about money loss after making online payment	
	5.	I am worried about additional costs for canceling the order	
	6.	I am worried that online booking and registration procedures are too cumbersome and time-consuming	
	7.	I am worried on spending too much time to make online booking.	
	8.	I am worried on spending too much time to learn the online booking process	

Perceived Risk	9.	I am worried about not being able to confirm whether the room is booked or not	0.897
	10.	I am worried that the real agency services cannot not meet my psychological expectations	
	11.	I feel unreliable to book a room online	
Costumers' satisfaction	1.	I use the online booking app as I want, anytime and anywhere.	0.945
	2.	Overall, I am satisfied with the online booking app that I use	
	3.	Online booking apps can meet my needs	
	4.	The room type that I booked by the online booking app can meet my expectations	
	5.	Online booking apps help me understand the hotel facilities	
	6.	Online booking apps can speed up my searching on hotel information	
	7.	Online room booking apps provide room booking procedures and precautions	
	8.	Online booking apps provide information on transaction query and change after the online booking process ends	
	9.	Online room reservation apps provide opinion survey (such as: opinion mailbox, QA) that satisfied me	
	10.	Interface design of the online booking app makes me feel comfortable	
Consumers' loyalty	1.	I will recommend the way to book a room online relatives and friends	0.943
	2.	I will positively promote online booking software	
	3.	I will use the online booking software again	
	4.	I rarely consider other booking methods	
	5.	I like to use online booking software	
	6.	Online booking APP is my first choice when I want to book a room in the future	
	7.	I feel that using the Internet for booking method for overall interface is satisfactory	

Correlation Analysis Of Inference Design, Perceived Risk, Customers' Satisfaction, And Customer Loyalty: Correlation of each variable was examined with Pearson's analysis, and the result is presented in (Table 2). Table 2 explains the significant and positive correlation between interface design and customer satisfaction (H1 is accepted). It means that when the quality of interface design increase, the level of satisfaction is also will increase. The correlation coefficient is 0.556 which mean that the correlation is strong according to the interpretation of r value (coefficient correlation value). Interpretation of r value is if r value exactly 1 (+ or -), it is a

perfect linier relationship; if below 1 until 0.70 (+, -) is a very strong relationship; if below 0.70 until 0.50 is a strong relationship; 0.5 is moderate relationship, below 0.5 until 0.3 is a weak relationship; below 0.3 a very weak relationship; and 0 is there is no relationship (Rumsey, et al. [20]). Second, Table 2 also shows the significant correlation between perceived risk and consumers satisfaction with the direction is a negative line (H2 is accepted). It means that if the perceived risk of online booking application increasing, the satisfaction on the online booking application is decreasing. The correlation coefficient is – 0.204, which indicates that it is very weak correlation. Lastly, the correlation of customers' satisfaction and customers' loyalty shows a significant and positive correlation (H3

accepted). It means that when the satisfaction on online booking application is increasing, the loyalty of the consumers to keep using the applications is also increasing. The correlation coefficient is 0.640 which shows a strong relationship of the two variables. From these findings, it can be seen that the strongest correlation among the others is the correlation of costumers' satisfaction between loyalty. It can be interpreted that when customers are satisfied with the particular online booking application, it definitely increases the loyalty of customers to use the particular reserve application in the next booking and to prioritize that application to when making travel plans.

Table 2: Pearson's Correlation analysis of each variable.

Variables	Inference design	Perceived risk	Customers' satisfaction	Customer loyalty
Inference design	1	-0.180**	0.556**	0.421**
Perceived risk	-0.180**	1	-0.204**	-0.184**
Customer's satisfaction	0.556**	-0.204**	1	0.640**
Customer's loyalty	0.421**	0.18	0.640**	1

Note: N = 387, ** is significant at 0.01 level, and * is significant at 0.05.

Table 3: Cross tabulation and Chi-square analysis on tested variables with respondents' demographic background.

Variables	Gender					Educational level			
			Male	Female	Total	High School	Bachelor	Master or higher	Total
Importance of interface design	Yes	f	186	183	369	27	230	112	369
		%	94.42	96.3	95.35	75	97.87	96.55	95.35
	No	f	11	7	18	9	5	4	18
		%	5.58	3.7	4.65	25	2.1	3.4	4.7
	Total	f	197	190	387	36	235	116	387
	$\chi 2$		7.87			37.37			
	P-Value		0.375			0.000*			
Risk availability	Yes	f	167	176	343	27	209	107	343
		%	84.77	92.6	88.6	75	88.9	92.2	88.6
	No	f	30	14	44	9	28	9	46
		%	15.23	7.4	11.4	25	11.9	7.8	11.9
	Total	f	197	190	387	36	235	116	387
	$\chi 2$		5.93			8.16			
	P-Value		0.015*			0.017*			
Satisfaction	Yes	f	184	164	348	35	217	96	348
		%	93.4	86.32	89.92	97.22	92.34	82.76	89.92
	No	f	13	26	39	1	18	20	39
		%	6.6	13.68	10.08	2.78	7.66	17.24	10.08
	Total	f	197	190	387	36	235	116	387
	$\chi 2$		5.36			10.2			

	P-Value		0.021*			0.006*			
Loyalty	Yes	f	192	185	377	35	228	114	377
		%	97.46	97.37	97.42	97.22	97.02	98.28	97.42
	No	f	5	5	10	1	7	2	10
		%	2.54	2.63	2.58	2.78	2.98	1.72	2.58
	Total	f	197	190	387	36	235	116	387
	$\chi 2$		0.003			0.492			
	P-Value		0.954			0.782			

Note: * significant at 0.05 level; the filled boxes show the highest percentage of categories of significant observed demographic variables.

Correlation of Demographic of Respondents on the Observed Variables: To examine the significance of respondents' background on the observed variables, the cross tabulation of the frequency of the answer were carried out, and the differences were evaluated using Chi-square test as presented in (Table 3). The result in Table 3 shows that the different level of education resulted in the significant result on the importance of interface design of online booking applications. For this variable, percentage of respondents who have master degree and higher level have the highest percentage compare to others. It means that the higher educational level, the more important of interface design when doing searching hotels or travel plans. For the crosstabulation of gender and level of age, they do not show a significant different on the importance of interface design. Relating the opinion on the risk of online booking, all the variables show the significant result. Female respondent valuing the risks of online booking is higher compare to the male respondent.

The percentage of master degree or above respondents valuing the risks of online booking is the highest among the other educational levels. Lastly, the oldest respondents (50-59 years old) believes that online booking reservation more risky compare to the younger respondents. For satisfaction in using online booking applications, all of the tested demographic characteristics show the significant result. The male respondents were more satisfied when doing online booking compared to the female respondents. The respondents who have the lowest educational level (junior-senior high school) were more satisfied compares to other educational level. Lastly, the customers in the youngest age level (below 30) were more satisfied compared to the other levels of age. Relating the consumers loyalty to use the online booking applications in the present and future, all of the tested basic characteristics show the not significant result. It means that the respondents have the same opinion that online booking application still the best choice when making reservation. It can be seen from the result, of 387 respondents only 10 of them who did not want to use internet to make reservation.

Discussion

Consumers' satisfaction and loyalty are two important things that should be noticed by hospitality industry and travel business in marketing strategy. The vast using of internet have made the online marketing of lodging services is the best choice to promote the lodging services because there is no time and space limitation to potential customers to get the information and to make reservation by accessing the travel and lodging service information by online. Hence, the factors such as interface design and perceived risk that considered as an important. The aim of this study was to examine the correlation of interface design of online booking application, perceived risk of online transactions, customers satisfaction, and customers loyalty on online booking application. This study provides several findings. First, there is a significant and positive relationship between interface design and satisfaction on online booking application, particularly for making room reservation. It can be interpreted that if the quality of interface design is good or high and easy to be operated, the consumers will be more satisfied. Interface of application or website is the displays of particular apps of website that provides information that need to be conveyed to potential customers. Interface contains information including combination of texts, pictures, symbols, charts, and videos that is designed to deliver enough information to customers and that has purpose to attract consumers to use their service [12-14]. A result study from (Dholakia, et al. [21]) also added that the easiness to find the product and clarity of product information as the attributes in the interface of website vendors or online applications significantly influence customers' satisfaction. The result of this study is in line with the previous studies which related to e-purchasing both online booking website and online shopping which found the positive correlation between interface and satisfaction [22,2].

Their study explained that the quality of interface or quality of website will increase the acceptance and satisfaction on e-commerce (Table 4). Perceived risk significantly decreases the satisfaction and loyalty to use the online booking application. This finding is consistent with the previous studies which mentioned

that perceived decrease consumers' attitude and intention to use the online application including for travel reservation [15,6]. The security risks perceived as the main and common causing factors of the consumers' reluctance to use online booking applications [23,24,6]. The consumers percei ved that the process of finding the finest hotels and making financial transaction the system is not fully secure in their system or it can be hacked. The doubt of leakage of personal information, credit card information, and money loss after doing online booking and online transaction have affected the consumers decision to make online reservation. Another reason is the psychology factor that can be affected by the mismatch of what is offered with the reality. The information on products and services is usually gained by searching websites that provide type of the room, room pictures, and facilities. However, the clients cannot see the real condition of the room and the hotel comprehensively. Moreover, the hotels could not update the recent pictures of the room, they can make a trick on shooting angel to produce the better images of rooms that create optical illusion to clients, or even they do not provide the true information about their facilities to attract the consumers. These risks and the own previous experiences or other experiences decrease the consumers satisfaction and loyalty on online reservation.

Table 4: Cross tabulation and Chi-square analysis on tested variables with respondents' demographic background.

Variables			Age				
			< 30	30-39	40-49	50-59	Total
Importance of interface design	Yes	f	46	149	123	51	369
		%	93.88	93.71	98.4	94.44	95.35
	No	f	3	10	2	3	18
		%	6.1	6.3	1.6	5.6	4.7
	Total	f	49	159	125	54	387
	$\chi 2$		3.93				
	P-Value		0.27				
Risk availability	Yes	f	29	146	117	51	343
		%	59.2	91.8	93.6	94.4	88.6
	No	f	20	13	8	3	44
		%	40.8	8.2	6.4	5.6	11.4
	Total	f	49	159	125	54	387
	$\chi 2$		48.65				
	P-Value		0.000*				
Satisfaction	Yes	f	45	144	112	47	348
		%	91.84	90.57	89.6	87.04	89.92
	No	f	4	15	13	7	39
		%	8.16	9.43	10.4	12.96	10.08
	Total	f	49	159	125	54	387
	$\chi 2$		14.32				
	P-Value		0.002*				
Loyalty	Yes	f	47	153	123	54	377
		%	95.92	96.23	98.4	100	97.42
	No	f	2	6	2	0	10
		%	4.08	3.77	1.6	0	2.58
	Total	F3	49	159	125	54	387
	$\chi 2$		0.388				
	P-Value		0.943				

Note: * significant at 0.05 level; the filled boxes show the highest percentage of categories of significant observed demographic variables.

Related the correlation of satisfaction and loyalty, this study found the strongest correlation between satisfaction and loyalty compared to other observed-paired variables. Which mean that if satisfaction increases, the loyalty definitely increases. Loyalty on online purchase or commonly said as e-loyalty is specified as the intention to re-visit the website and re-purchase from online vendors [25]. In this study, loyalty also include the consumers' willingness to recommend the online booking applications to others and make online e-purchase as the main priority when making travel planning (to reserve lodging). To explain this finding, the consumer satisfaction diagram service developed by (Fornell, et al. [26]) describes that loyalty is positively influenced by satisfaction, and satisfaction is positively influenced by perceived value and quality. The respondents in this present study also mostly satisfy with the online hotel/travel preservation in previous experiences. Even though consumers perceived some risk when making online purchase, consumers presume that online booking still the best choice compare to traditional method because of its number of benefits such as lot of options, more convenience, more saving time, not limited by time and locations, global distribution, and many other benefits. Hence, the respondents were mostly agreed (97, 42%) to make e-purchase in future (the result in Table 3). This result which found the significant positive correlation between satisfaction and loyalty on online booking hotel are also supported by the previous researches that related to online purchase [27,21,1]. Differences on demographics of respondents also resulted in the different perception in some variables on the importance of interface design, perceived risk and satisfaction on online booking application. Female respondents perceived the higher risk of making reservation through online compare to male respondents, while related satisfaction male respondents more satisfy compare to female respondents. According to social psychology, men portray a set of personal traits related to adventurousness and a greater proneness to risk, whereas females are more in favor of easy and routine tasks [28].

The process of online boking and transaction with its high risk have made the female respondents perceived the higher risk of online process and more dissatisfaction on the process and the result made by online transaction compared to male respondents. Meanwhile, men with their own experiences with internet and technology have more be able to cope the online process risk and easier to choose and to adjust their needs by using the user interfaces which increases their satisfaction. Therefore, the alternative that the women can take is to use travel agency service to manage their needs. Furthermore, the different level of education shows the different result on the importance of interface design, perceived risk, and satisfaction with the result: the importance of interface design is perceived more important to the higher educational level; perceived risk is higher for the more educated people; and satisfaction is higher for the lower educated people. This finding indicates that education improves the ability to understand the internet and computer system that make the higher educated people perceive the more importance of the quality of web design and user interface to convey the information to users, and they also easily recognize the risk of online booking trough their experiences. However, relating to satisfaction, the lower educational level resulted in that the more satisfaction. Regarding age level, the oldest respondents perceived that the risk of online booking reservation is highest compared to other age levels. A study conducted by (Mayr, et al. [24,29]) found that the older customers (above 50 years old) less prefer to do online booking than the younger customers due to some reasons including the risk on online reservation and hardly to find the appropriate products, and they were the more dissatisfied customers.

Conclusion

The primary purpose of the study of correlation of interface design, perceived risk, satisfaction and loyalty is to find out the significant influencing factors on technology and social behavior and that lead to build the long-lasting relationship of consumers in e-commerce context. As we know that most of the people activities nowadays have used internet as the main tool, channel, or infrastructure to fulfill people needs. Hence developing a credible online application is important in marketing strategies including hospitality and travel business. This present study found that the increasing of quality of interface design of website increases the consumers satisfaction and loyalty to the hotel/travel online booking application. Which mean that the good design, enough and complete information, and easiness to be operated or to search the information of the products or services are important to be noticed by marketers in the website. Furthermore, the perceived risk will decrease satisfaction to make online purchase for lodging or travel reservation. The leakage of personal data and banking information is the main concern that influence the people intention to make online booking. Additionally, the incompatibility of feature and information in website with the reality is also an important aspect that decrease the people trust in e-purchasing. Hence, the service providers should build the consumers trust and increase security of the website to increase and maintain the consumers loyalty.

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