# DETERMINANTS OF CONSUMER' PREFERENCES FOR ROBOT SERVICE HOTEL: AN EXPERIMENT AMONG VIETNAMESE YOUNG TRAVELLERS

# Thai Ngoc PHAM \*

Dong Thap University, Faculty of Economics - Law, Dong Thap, Vietnam, e-mail: ptngoc@dthu.edu.vn

**Citation:** Pham, T.N. (2024). DETERMINANTS OF CONSUMER' PREFERENCES FOR ROBOT SERVICE HOTEL: AN EXPERIMENT AMONG VIETNAMESE YOUNG TRAVELLERS. *Geojournal of Tourism and Geosites*, 53(2), 638–646. https://doi.org/10.30892/gtg.53227-1239

**Abstract:** The study intends to determine prominent antecedents of Vietnamese young travelers' intentions to book robot service hotels during and after the health pandemic. The study aims to leverage the context to uncover the guests' preferences toward a secure option when a health crisis is salient. A quantitative research method was employed to collect qualified data. The extended TAM theory was employed to develop research hypotheses. SPSS and AMOS version 24 were used to analyze data and confirm the research hypotheses. The study found that guests' booking intention toward robot service hotels during the health pandemic played a mediation role in linking the influence of social distancing concerns, subjective threat norms, perceived trust, and consumer cosmopolitanism on their intentions after the health pandemic. The study provides a valuable understanding of the determinants of Vietnamese young travelers' preferences for robot-service hotels. Moreover, the study highlights the significance of situation in deciding guests' intentions, and thus it is strongly recommended that practitioners take context into consideration when sharpening their strategies.

**Keywords:** robot-service hotel, booking intention, social distancing concerns, subjective threat norms, perceived trust, consumer cosmopolitanism

\* \* \* \* \* \*

## INTRODUCTION

The hospitality industry has been well characterized by human interaction for its value creation (Pelit and Katircioglu, 2022). Despite dramatic changes from manual to automation technologies occurring across sectors, hospitality is argued to maintain its extensive reliance on human labor (Choi et al., 2020). A larger number of hotel managers have believed that guests rated their experience with human staffs higher than that with robots because they provided sympathetic care and friendly services in such an industry, which is emotion dominance (Kim et al., 2021). However, forward-thinking experts have postulated that robots will gradually replace some human tasks in exchange for efficiency and consistency, but exactly when and how the replacement has been undertaken still remains questioned. This is because adapting a new technology requires vast investment, while the actual value cannot be achieved unless customers truly desire it (Lee et al., 2021).

In hotels, managers pinpoint that it will likely take substantial time and effort to introduce robot services since guests often feel reluctant to be involved in cognitive activities. Nam et al. (2021) have suggested that context plays a key role in stimulating the acceleration of new technology adoption, and when a user becomes familiar with a platform, he or she will probably access it again. Thus, hotel managers tended to be hesitant to implement automation services because there had been 'a truly perfect chance' for robot labor (Tussyadiah and Park, 2018). Consequently, studies about robot services at this time have focused on finding out how robots should be designed to perform their tasks as humans rather than how their distinctive values are accepted by guests (Tung and Au, 2018; Ivanov and Webster, 2019). In other words, robot services have been implemented in hospitality because they could replace human staff in some specific tasks, not because they provide efficient and reliable services. Optimistic managers have still indicated that there will always be segments that have been seeking values provided by robots (Tung and Au, 2018; Lu et al., 2019).

On March 11, 2020, the World Health Organization (WHO) proclaimed the SARS-CoV-2 coronavirus to be a worldwide health pandemic (Yang et al., 2020). Within a few months of being first reported in 2019, the COVID-19 outbreak spread globally (Wu et al., 2020). Human interaction has been reduced substantially because humans are determined to be the main transmitter, and the existence of COVID-19 seriously influenced all social and economic aspects as well as changed how people live and work (Jiang and Wen, 2020). Closing is just a temporary decision if it lasts for a couple of days, but COVID-19 is regarded as a reality rather than an end point (Pillai et al., 2021). Historical epidemic and pandemic outbreak records have occurred unexpectedly and thus significantly pushed the managers to redefine the hospitality operations to achieve a more sustainable competitive advantage. Hygiene, cleanliness, and safety are the most focal points for the reformulation since they are ranked as pivotal criteria to select a hotel when there is a global health crisis. Robot services are not new, but they are novel solutions to reduce human interaction and increase consistent services (Jung et al., 2023). A growing number of hotels and restaurants employing robots in parallel with employees have been introduced and confirmed their effectiveness on business operations (Tuomi et al., 2021; Zhong et al., 2022). Recent

\_

<sup>\*</sup> Corresponding author

empirical studies have found a higher guest preference for service robots during and after COVID-19 (Tuomi et al., 2021; Jung et al., 2023; Leung et al., 2023). Although consumers' adoption of robotics has been promising, little is known about which drives guests' intention to book robot-serviced accommodations during and after the pandemic (Kim et al., 2021; Pizam et al., 2022). It is believed that understanding the determinants of consumers' preferences for robot services will certainly help hotel managers identify psychological facilitators and better adjust their strategic activities (Rasheed et al., 2023).

Vietnam reacted early and strongly to the spread of COVID-19 by imposing social distancing measures and mobility restrictions. The COVID-19 pandemic has made Vietnamese hospitality businesses realize the role of social-psychological factors in deciding consumer preference when concerns for health are salient (Jung et al., 2023). Despite the considerable pressure of a global health crisis on the Vietnamese tourism industry recently, little is known about which factors stand behind preference for robot services (Nguyen et al., 2023). This study intends to identify prominent determinants of guests' booking intentions toward robot-staffed hotels during and after a global pandemic.

Taking COVID-19 as an example of a global health crisis, the study will conduct an experiment to investigate the behavioral intention to book a robot-staffed hotel in the context of disease spread. Leveraging on the extensive theory of technology acceptance (TAM), the authors have proposed that subjective norms, social distancing concerns, perceived risk, and consumer cosmopolitanism would explain guest preferences toward robot-service hotels during a global health crisis. Among those, subjective norms, social distancing concerns, and perceived risk have been categorized as social-psychological factors, while consumer cosmopolitanism has been considered a consumer consumption orientation. Regardless of the unforseen outbreak of a health pandemic, it would be controlled, and subsequently, this study aims to examine guests's booking intentions toward a robot services hotel even after a global health crisis.

A pandemic in the study will serve as a transformation point in which guests have adopted robot services due to their benefits. The result would help hotel managers predict guests' intentions after the global outbreak has been handled, which would definitely reshape their future automated strategies (Akdim et al., 2023).

#### LITERATURE REVIEW

#### 1. Human-staffed versus robot-staffed hotel

Hospitality is named after a shared experience between a host and a guest. The industry is representative of the friendly attitudes of service providers who make visitors feel respected, cared for, and welcomed (Kim et al., 2021).

Human-staffed hotel: A hotel is a symbol of the hospitality industry because it mainly builds on human relationships to create values. Hospitality research before 2019 has seen the favorability of human employees in their interactions and problem-solving skills (Kim et al., 2021). Reis and colleagues (2020) have made the prediction that human staff is hardly replaced by robots in such a highly emotional industry, and employees are better at their emotional intelligence. However, human service is vulnerable to quality variation as well as disease sensitivity, and thus human staff is highly susceptible to stable service provision (Choi et al., 2020; Kim et al., 2021).

Robot-staffed hotel: Automation and artificial intelligence are changing the nature of the labor workforce across industries (Raj and Seamans, 2019). The adoption of robot service has brought outstanding benefits such as improving service delivery, reducing labor costs as well as dependence, and significantly raising productivity and efficiency (Kimet al., 2021; Wang et al., 2022). More importantly, employing robots in hotels could achieve heterogeneity and standardization that are often failed by human staff (Belias, 2020). Some authors have also mentioned that the introduction of robot-staffed jobs has served better tech-savvy segments (Wang et al., 2022). However, human employees delivered the highest-quality interactions and gave consumers superior compassionate care and supportive services when unprogrammed problems arose (Shimmura et al., 2020).

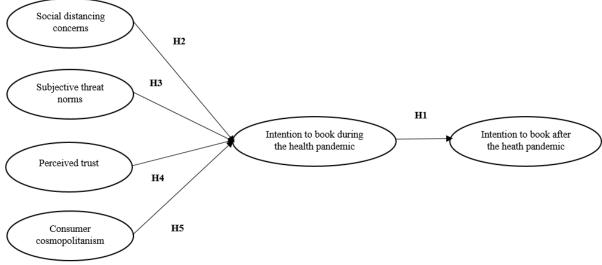


Figure 1. Proposed research model (Adapted from Kim et al., 2021)

## 2. Underlying theory and conceptual model

The extended technology acceptance model (TAM) has been employed to explain the adoption intention toward new

technology and identify prominent antecedents that lead to that behavior in the target consumers. The TAM model was first proposed by Davis (1989) with two main factors: perceived usefulness and perceived ease of use, to determine consumers' behaviors in terms of attitude, intention, and actions. Later, the TAM model was extended to include various perceived values and threats, as well as external variables, to better demonstrate how an advanced application has been accepted and used. Based on the underlying theory and previous research, it is proposed that guests' booking intentions toward robot service hotels after the health pandemic are determined by their booking intentions during the health pandemic. During the crisis, social distancing concerns, subjective threat norms, perceived trust toward robot service hotels, and consumer cosmopolitan ism will influence booking intention (Kim et al., 2021). Figure 1 is the proposed research model for the hypothesis.

# 3. Theoretical definitions and hypotheses development

#### 3.1. Guest's booking intention toward Robot Services hotel

Intention is defined as a willingness stored in human memory that will lead to an action at the perfect time (Ajzen, 2012). Intention is argued to be a motivation that will consequently drive behavior. In other words, the higher the intention, the higher the motivation to carry out that intention. However, the relationship will change if there is a longer time between intention and action. Guests' booking intentions refer to their willingness to select a hotel for their stay (Cha, 2020). When consumers successfully adopt a new technology, it is expected that they will keep their decisions as long as they are still satisfied with the selected choice. Kim and colleagues (2021) have provided empirical confirmation for a guest's hotel booking intention, which would influence his or her intention toward robot-staffed hotels even after the pandemic. Thus, it is proposed that:

**H1:** Guest booking intention toward robot service hotels during the health pandemic will positively influence on intention after the health pandemic.

3.2. Social distancing concerns toward the health pandemic

Social distancing is a commonly implemented measure to reduce the spread of a virus when a human is a transmitter of the disease. From the first detection of the coronavirus until it became a global pandemic, social distancing and isolation have been the most responsive strategies of most countries (Anderson et al., 2020). Together with risk communication and cases reported, people have been well aware of the pandemic and its negative consequences on human health during the recent COVID-19. Practicing social distancing and getting vaccinated have both been widely accepted as effective preventative measures (Anderson et al., 2020). It was noticed that people had changed their habits to quickly adopt COVID-19 and were more concerned about human touch during that time (Beck and Hensher, 2020; Maryati, 2020; Maltagliati et al., 2021). A higher concern for social distancing likely would drive people to select alternative solutions for limiting physical experience. Recent empirical studies have found support for social distancing concerns and booking intention toward machine application to minimize human interaction when the pandemic has been salient (Zhang et al., 2020; Kim et al., 2021). Since the global pandemic caused by COVID-19, people have become familiar with social distancing practices and would likely book a robot services hotel during a time when there is a similar global health crisis. Thus, we propose:

**H2:** Social distancing concerns will positively influence on guest booking intention toward robot service hotels during the health pandemic.

# 3.3. Subjective threat norms

Subjective norms are referred to as normative beliefs about the social expectations of significant people in a given society and will drive an individual to comply with those expectations (Fishbein and Ajzen, 1977; Ajzen, 2012; Cho and Lee, 2015). Consumer psychologists have highlighted the significant role of subjective norms on consumer perceptions and intentions in the context of uncertainty, when consumers are more easily influenced by others when they feel insecure (Gong et al., 2021). Empirical results have also confirmed the positive impact of subjective threat norms on consumer perceived risk and behavior intention to reduce that risk (Kaushik et al., 2015; Polat et al., 2021). Moreover, the level of influence is expected to be more prominent in collectivist cultures than in individualist ones since consumers ranking high in collectivism tend to comply with group norms (Polat et al., 2021). Thus, we propose that:

H3: Subjective threat norms will positively influence guest booking intention toward robot service hotels during the health pandemic.

# 3.4. Perceived trust

Trust can be described as a feeling of assurance and a willingness to rely on someone or something (Roca et al., 2009). Trust is regarded as a dynamic process and has been continuously accumulated over time. Consumer trust has been defined in two ways: (1) as a belief, confidence, attitude, or expectation; and (2) as a behavioral intention in the future (Chen, 2008; Kim et al., 2011). During the time of the global health crisis, where humans are identified as the main transmitters, consumers perceived trust in robot-staffed activities as more preferable and demanding for physical activities such as hotels, restaurants, public places, airlines, hospitals, etc. (Cha, 2020; Pani et al., 2020; Ghafurian et al., 2021). Kim and colleagues (2021) have confirmed the positive relationship between guests' perceived trust and intention to select rob otstaffed hotels during the time of COVID-19. Thus, we propose:

**H4:** Perceived trust toward robot-staffed hotels will positively influence guests' booking intention toward robot staffed hotels during the health pandemic.

# 3.5. Consumer cosmopolitanism

Cosmopolitan consumers hold an orientation that views themselves as world consumers and the world as their marketplace (Prince et al., 2016). They address functional needs and make purchasing decisions based on products that best deliver the desired performance, regardless of cultural differences and social variances (Bartsch et al., 2016). Consumer cosmopolitanism welcomes innovation and respects differences, and thus they express higher levels of new technology acceptance in exchange

for better values. Empirical findings have been found in service industries, particularly among younger segments who often reflect a high level of cosmopolitanism in their consumption habits (Kaushik et al., 2015). Thus, we propose:

**H5:** Consumer cosmopolitanism will positively influence on guest's booking intention toward robot service hotels during the health pandemic.

## MATERIALS AND METHODS

#### 1. Data collection

This study has been approached using quantitative research methodology. After hypotheses have been developed from the literature review, a survey will be designed to collect quantitative data. A questionnaire has been comprised of four sections, and participants have been informed to complete several tasks. The first section included short information about a global health pandemic, its mechanism, and related health consequences, together with mobility requirements and restrictions that might be implemented by governments if it had been salient. The second section asked participants to evaluate their levels in terms of: (1) subjective threat norms; (2) consumer cosmopolitanism; and (3) social distancing concerns. The third section first required participants to imagine their next trips and plan to select a hotel. Then, the section included evaluations in terms of: (1) perceived trust toward robot service hotels; (2) booking intention toward robot service hotels during and after the health pandemic. The final section was about demographic information. Back-translation has been employed to establish content equivalence and meaning validation (Koenig and Al Zaben, 2021). Reflective measurement scales were adapted to conceptualize constructs in the study. Each variable in the reflective constructs was measured by the Likert scale, with an anchor from 1 classified as strongly disagreeing to 5 classified as strongly agreeing. For the fourth section, a closed-end system with several options was designed to collect the data. The applied scales were selected and filtered from the pilot test to get the most appropriate ones for the Vietnam context before they were widely distributed. Table 1 provides reflective measurement scales adapted from the questionnaire.

Table 1. Adapted measurement scales

Measurement scale	Authors			
Social threat norms				
Most people who are important to me think it is okay for me to engage in untact tourism.				
Most people who are important to me support that I engage in untact tourism.	Ajzen (2012)			
Most people who are important to me agree with me about engaging in untact tourism.				
Most people who are important to me understand that I engage in untact tourism.	1			
Social distancing concerns				
I keep social distance from others.				
I support social distancing when the health pandemic is salient.	(2021)			
Practicing social distancing to reduce the widespread of the health pandemic.	1			
Perceived trust				
In general, I trust in the robot-staffed hotels.	1			
I would describe the robot-staffed hotels as reliable.	Cha (2020)			
Robots have better hy gienic practice.				
Robots cannot transmit diseases to humans.	1			
Consumer cosmopolitanism				
Care about product's information in its label to evaluate the quality.	1			
Depend on perceived performance to evaluate product quality.				
Different brands from different countries will be different so I have to try to find the best suit for my needs/wants.	Pham and			
Know many products and brands to find which are appropriate.				
Care about the well-being of society.				
Search information before making a decision.				
Don't care about made-in information but brands.				
Prefer to buy products that could be used in many situations.				
Guest's intention to book robot-staffed hotels during the health pandemic				
Given the opportunity, I would book robot-staffed hotels during the health pandemic.	Cha (2020)			
I am likely to book robot-staffed hotels during the health pandemic.	Clia (2020)			
I will book robot-staffed hotels during the health pandemic.				
Guest's intention to book robot-staffed hotels after the health pandemic				
Given the opportunity, I would book robot-staffed hotels after the health pandemic.	Cha (2020)			
I am likely to book robot-staffed hotels after the health pandemic.	Cha (2020)			
I will book robot-staffed hotels after the health pandemic.				

The research was conducted in Ho Chi Minh City, the biggest metropolis of 10 million Vietnamese, where there has been the highest percentage of mobility for their businesses and personal travels. However, in response to the fourth wave of COVID-19, Vietnamese authorities issued social distancing measures and a lockdown from July 9th to September 30th (Hoang et al., 2021). Vietnamese during that time have been significantly affected by the outbreak of COVID-19 and dramatically changed their lifestyles and habits (Doan et al., 2023). So the study asked if a global health crisis would arise again, and COVID-19 was used as a real example for participants to elevate their answers. Vietnamese and Ho Chi Minh City have made the perfect context to conduct an experiment to identify determinants of guests

booking intention toward robot service hotels during and after the health pandemic. A convenient sampling method was employed to approach the main respondents. Participants living in Ho Chi Minh City during the time of lockdown, with ages ranging from 25–40 years old and having experienced mobility, were the main target. It is argued that the selected participants represented an appropriate sample for this research objective.

## 2. Data analysis

First, the research model was assessed to ensure the reliability and validity of the tests through Exploratory Factoring Analysis (EFA) and Confirmatory Factoring Analysis (CFA) tests. Structural Equation Modeling (SEM) was performed as suggested by Babin et al. (2008) to confirm the research hypotheses. The hypotheses will be significant at a p-value lower than 0.001. Descriptive statistics would also be conducted to describe the sample. Harman's Single Factor Test has been employed in CFA to check common method variance. A common method variance appears if all indicators are purposely loaded on one factor, gaining an acceptable model fit (Fuller et al., 2016).

#### RESULTS

There were 401 usable cases after 1,200 surveys distributed. Table 2 provides the demographic information of the sample. The six constructs were first checked for internal consistency through Cronbach's Alpha. All have achieved good reliability (all ranged higher than 0.8). The EFA test was employed to test the dimensionality of constructs and exclude unqualified items. The KMO and Bartlett's test (0.901) and the cumulative total variance explained (86.661) satisfied the threshold value. The pattern matrix expressed the dimensionality of constructs as a theoretical expectation. The CFA was conducted to test the reliability in terms of composite reliability and the validity in terms of convergent and discriminant validity. Figure 2 provides the constructs measurment in the research model. The model fit passed the cut-off values: (1) Cmin/df = 1.814; (2) CFI = 0.983; (3) IFI = 0.983; and (4) RMSEA = 0.039. Common method variance has not been an issue in the study since the model fit of all indicators under one factor did not gain an acceptable model fit (Fuller et al., 2016). Table 3 shows the construct measurements in which all constructs achieved reliability and validity.

	N=401	N	%
Gender	Male	165	41.1
	Female	236	58.9
Age	Less than 35	237	59.1
	From 35 and above	164	40.9
Marital status	Single	216	53.9
	M arried	185	46.1
Education level	High school	18	4.5
	College/ University	320	79.8
	Post-graduate	63	15.7
Income	Less than 10 million VND pm.	147	36.7
	From 10 million and above	254	63.3

Table 2. Profile of participants in the study

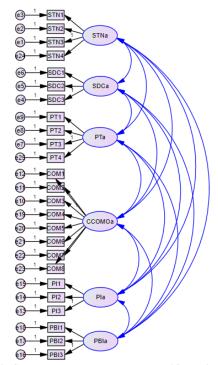


Figure 2. Constructs measurement (From this study analyzed)

Table 3. Construct measurements analyzed by CFA	Table 3.	Construct	measurements	analy	zed by	CFA
-------------------------------------------------	----------	-----------	--------------	-------	--------	-----

	CR	AVE	MSV	ASV	STNa	CCOMOa	SDCa	PTa	BIa	PBIa
STNa	0.970	0.889	0.185	0.082	0.943					
CCOMOa	0.968	0.792	0.016	0.007	0.022	0.890				
SDCa	0.985	0.957	0.067	0.019	-0.042	-0.056	0.978			
PTa	0.964	0.869	0.168	0.082	0.254	0.008	0.087	0.932		
BIa	0.961	0.891	0.355	0.153	0.399	0.116	0.259	0.410	0.944	
PBIa	0.965	0.901	0.355	0.148	0.430	0.125	0.130	0.409	0.596	0.949

All constructs in the research model were satisfied with their psychometric properties in terms of internal consistency, reliability, convergence, and discriminant validity. The research model was analyzed by the SEM test, and the model fit was achieved with the accepted fit by Babin et al., (2008). The model fit of the structural equation modelling passed the threshold values: (1) Cmin/df = 2.243; (2) CFI = 0.98; (3) IFI = 0.98; and (4) RMSEA = 0.031. Table 4 provides the results of the standardized path estimates and hypothesis testing.

Table 4. Standardized path estimates and hypotheses testing in the study (Note: \*\*\*: p-value < 0.001; ns: non-significant)

Structural paths	Standardized regression weight	p-value	Conclusion at p<0.05
H1: Guest booking intention toward robot service hotels during the health pandemic → positively influence on intention after the health pandemic	0.6	***	Confirmed
H2: Social distancing concerns → positively influence on guest booking intention toward robot service hotels during the health pandemic	0.252	***	Confirmed
H3: Subjective threat norms → positively influence on guest booking intention toward robot service hotels during the health pandemic	0.335	***	Confirmed
H4: Perceived trust toward robot staffed hotels → positively influence on guest's booking intention toward robot staffed hotels during the health pandemic	0.308	***	Confirmed
H5: Consumer cosmopolitanism → positively influence on guest's booking intention toward robot service hotels during the health pandemic	0.123	0.004	Confirmed

The results statistically confirmed five of the seven hypotheses of the research model. Figure 2 shows the results of the research hypotheses. Concerns about social distancing, perceived trust in robot-staffed hotels, subjective threat norms, and consumer cosmopolitanism all influence consumer preferences for robot-staffed hotels. Moreover, the authors also found that consumer preferences for robot-staffed hotels during the outbreak of the health pandemic would subsequently increase their intention to book for robot-staffed hotels after the health pandemic. The study has confirmed the relationship among constructs as expected, and the study has approved the role of consumer preference for robot-staffed hotels during the health pandemic in bridging the influence of subject threat norms, consumer cosmopolitanism, social distancing concerns, and perceived trust toward robot service hotels on guests' booking intentions toward robot-staffed hotels after the health pandemic. Figure 3 depicts the result of research hypotheses.

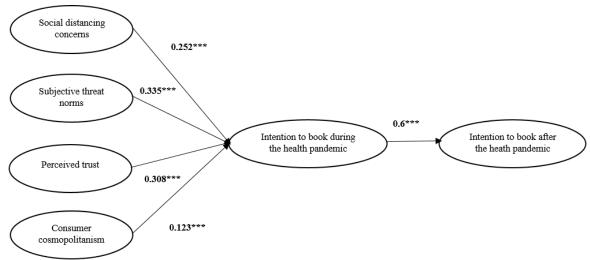


Figure 3. The result of research hypotheses (From this study analyzed)

#### **DISCUSSION**

# 1. Theoretical implications

Theoretically, the study empirically confirmed the validity of the extended TAM theory in times of global health crises. The results have provided logical explanations for the adoption of new technology when a pandemic was salient. The study has been conducted in a specialized context in which the participants imagined they would be in a health crisis like what they had expericed during the COVID-19, which made the study more rational to estimate the relationship among

variables. In line with previous studies that adapted the extended TAM theory, consumer intentions are driven by their perceived trust and risk associated with that option. We found that Vietnamese guests' booking intentions were determined by their social distancing concerns, subjective threat norms, consumer cosmopolitanism, and perceived trust toward robot-staffed hotels because the application of robotics was evaluated as an effective way to reduce the transmission when it was widespread. The findings have highlighted the mediation role of booking intention toward robot service hotels during the health pandemic to explain the influence of subjective threat norms, consumer cosmopolitanism, social distancing concerns, and perceived trust toward robot hotels after the pandemic.

#### 2. Managerial implications

Managerially, the study has accentuated drivers of guests' booking intentions toward robot-staffed hotels during and after the health pandemic. Consumer preferences for any new solution will be influenced by the perceived cost and benefits associated with that option. Consequently, to promote a new technology, managers should focus on strategies highlighting the benefits it provides, such as usefulness, trust, convenience, etc. The outbreak of the health pandemic is a reality that our world has to accept, regardless of its adverse consequences. Although any pandemic will always end, no experts or scientists can predict the exact time. Obviously, the longer the health pandemic is salient, the greater the perceived risk and preference for more secure options. Reconstruction hotel operations are urgent in handling and preparing for crises and uncertainties that might happen unexpectedly (Kim et al., 2021). Historical epidemics and pandemic outbreaks causing serious damage to the hospitality industry in the 21st century are listed as: (1) the severe acute respiratory syndrome (SARS) outbreak in 2003; (2) the H1N1 pandemic in 2009; (3) the Middle East respiratory syndrome epidemic (MERS) in 2012; (4) the Ebola virus epidemic in 2014; and (5) the Zika virus epidemic in 2016. Thus, technology-based solutions deserve to be put into consideration because they provide feasible ways to achieve contactless service when the human touch is reduced. Experts have suggested that businesses in the hospitality and tourism industries should invest in technology together with human resources to more responsively cope with the future and ensure the goals of hygiene, cleanliness, and safety. The study further highlights that crisis communication and local restrictions serve as facilitators for consumers' adoption of new technology when that technology helps to reduce risk concerns. Moreover, the findings have indicated that consumer cosmopolitanism would be more receptive to accepting robot-staffed hotels. As a result, it is recommended that companies start their recovery strategy with guests ranking high in their cosmopolitanism in purchasing habits, and the young segment in cities or urban areas tends to express a higher level of cosmopolitanism. Furthermore, the mediation role of booking intention during the health pandemic will lead to booking intention toward robot hotels even after the health pandemic. The global risk crisis in the study has served as a facilitator for the acceptance level toward ro bot application in life aspects. Regardless of the negative consequences caused by COVID-19, we believe that it has caused a significant change in guests' habits and accelerated robot adoption during the time it was salient, and that would influence guests' selection toward robot hotels in the future. It is strongly suggested that hotels employ robot applications in their operations in order to better confront uncertainties if there is a situation that requires social distancing.

### 3. Limitations and future directions

Aside from scientific and practical findings, the study has suffered from weaknesses. The first limitation derives from the survey convenience sampling method, which may not be representative of the overall target market. Future researchers could improve by employing more representative inquiry methods such as norm sampling and random probability sampling. The second limitation derives from the limited number of samples collected, which might have an influence on empirical results. Thus, it is suggested that future research should increase the samples to enhance the power of estimations. The third limitation derives from the conceptual models. There have been some factors selected to be taken into account in the research models, and thus the overall picture of drivers and consequences has not been included. Future studies should take into consideration other factors serving different roles to examine the relationship between consumer cosmopolitanism in various contexts. The last limitation comes from the context employed to evaluate the participants' answers. The global health pandemic was employed, and robot acceptance was significant because it helped to reduce human touch, but other contexts would lead to different preferences. Future research should take into account a match between context and option in measuring consumers' evaluations.

# CONCLUSION

The study has successfully identified prominent determinants of booking intention toward robot-staffed hotels during and after the health pandemic. Subjective threat norms, perceived trust, social distancing concerns, and cosmopolitanism are antecedents of robot booking intention. Among those, subjective threat norms and perceived trust pose the strongest impacts on guests intentions. The study concludes that when the health pandemic is salient, intention toward a new solution is significantly influenced by social norms about the health crisis and perceived trust toward robot-staffed hotels during the pandemic. It is recommended that context play a decisive role in facilitating consumer adoption of a new technology, and thus managers should take into account the benefits and costs perceived by customers when designing a new service.

**Author Contributions:** Conceptualization, T.N.P.; methodology, T.N.P.; software, T.N.P.; validation, T.N.P.; formal analysis, T.N.P.; investigation, T.N.P.; data curation, T.N.P.; writing - original draft preparation, T.N.P.; writing - review and editing, T.N.P.; visualization, T.N.P.; supervision, T.N.P.; project administration, T.N.P. All authors have read and agreed to the published version of the manuscript

Funding: Not applicable.

**Institutional Review Board Statement:** Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

**Acknowledgments:** The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

**Conflicts of Interest:** The authors declare no conflict of interest.

### REFERENCES

- Ajzen, I. (2012). Values, attitudes, and behavior. In *Methods, theories, and empirical applications in the social sciences*, 33-38, Wiesbaden: VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-18898-0\_5
- Akdim, K., Belanche, D., & Flavián, M. (2023). Attitudes toward service robots: analyses of explicit and implicit attitudes based on anthropomorphism and construal level theory. *International Journal of Contemporary Hospitality Management*, 35(8), 2816-2837. https://doi.org/10.1108/ijchm-12-2020-1406
- Anderson, R.M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T.D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic?. *The lancet*, 395(10228), 931-934. https://doi.org/10.1016/s0140-6736(20)30567-5
- Babin, B.J., Hair, J.F., & Boles, J.S. (2008). Publishing research in marketing journals using structural equation modeling. *Journal of marketing theory and practice*, 16(4), 279-286. https://doi.org/10.2753/mtp1069-6679160401
- Bartsch, F., Riefler, P., & Diamantopoulos, A. (2016). A taxonomy and review of positive consumer dispositions toward foreign countries and globalization. *Journal of International Marketing*, 24(1), 82-110. https://doi.org/10.1509/jim.15.0021
- Beck, M.J., & Hensher, D.A. (2020). Insights into the impact of COVID-19 on household travel and activities in Australia–The early days of easing restrictions. *Transport policy*, 99, 95-119. https://doi.org/10.1016/j.tranpol.2020.08.004
- Belias, D. (2020). Research methods on the contribution of robots in the service quality of hotels. In *Strategic Innovative Marketing and Tourism: 8th ICSIMAT, Northern Aegean, Greece, 2019*, 939-946, Springer International Publishing. https://doi.org/10.1007/978-3-030-36126-6\_104
- Cho, H., & Lee, J.S. (2015). The influence of self-efficacy, subjective norms, and risk perception on behavioral intentions related to the H1N1 flu pandemic: A comparison between K orea and the US. *Asian Journal of Social Psychology*, 18(4), 311-324. https://doi.org/10.1111/ajsp.12104
- Cha, S.S. (2020). Customers' intention to use robot-serviced restaurants in Korea: relationship of coolness and MCI factors. *International Journal of Contemporary Hospitality Management*, 32(9), 2947-2968. https://doi.org/10.1108/ijchm-01-2020-0046
- Chen, Y.S. (2008). The driver of green innovation and green image—green core competence. *Journal of business ethics*, 81(3), 531-543. https://doi.org/10.1007/s10551-007-9522-1
- Choi, Y., Choi, M., Oh, M., & Kim, S. (2020). Service robots in hotels: understanding the service quality perceptions of human-robot interaction. *Journal of Hospitality Marketing & Management*, 29(6), 613-635. https://doi.org/10.1080/19368623.2020.1703871
- Davis, F.D. (1989). Technology acceptance model: TAM. Al-Suqri, MN, Al-Aufi, AS: Information Seeking Behavior and Technology Adoption, 205, 219. https://doi.org/10.4018/978-1-4666-8156-9.ch013
- Doan, T., Aquino, R., & Qi, H. (2023). Homestay businesses' strategies for adapting to and recovering from the COVID-19 pandemic: A study in Vietnam. *Tourism and Hospitality Research*, 23(2), 213-225. https://doi.org/10.1177/14673584221103185
- Fishbein, M., & Ajzen, I. (1977). Belief, attitude, intention, and behavior: An introduction to theory and research. *Philosophy and Rhetoric*, 10(2). https://doi.org/10.2307/2065853
- Fuller, C.M., Simmering, M.J., Atinc, G., Atinc, Y., & Babin, B.J. (2016). Common methods variance detection in business research. *Journal of business research*, 69(8), 3192-3198. https://doi.org/10.1016/j.jbusres.2015.12.008
- Ghafurian, M., Ellard, C., & Dautenhahn, K. (2021). Social companion robots to reduce isolation: A perception change due to COVID-19. In *Human-Computer Interaction–INTERACT 2021: 18th IFIP TC 13 International Conference, Bari, Italy, August 30–September 3, 2021, Proceedings, Part II 18*, 43-63, Springer International Publishing. https://doi.org/10.1007/978-3-030-85616-8\_4
- Gong, Y., Zhang, L., & Sun, Y. (2021). More than just a mental stressor: psychological value of social distancing in COVID-19 mitigation through increased risk perception—a preliminary study in China. *Humanities and Social Sciences Communications*, 8(1), 1-6. https://doi.org/10.1057/s41599-021-00774-1
- Hoang, T.G., Truong, N.T., & Nguyen, T.M. (2021). The survival of hotels during the COVID-19 pandemic: a critical case study in Vietnam. Service Business, 15(2), 209-229. https://doi.org/10.1007/s11628-021-00441-0
- Jiang, Y., & Wen, J. (2020). Effects of COVID-19 on hotel marketing and management: a perspective article. *International journal of contemporary hospitality management*, 32(8), 2563-2573. https://doi.org/10.1108/ijchm-03-2020-0237
- Jung, I., Quan, W., Yu, J., & Han, H. (2023). Are you ready for robot services? Exploring robot-service adoption behaviors of hotel-goers. *International Journal of Hospitality Management*, 109, 103404. https://doi.org/10.1016/j.ijhm.2022.103404
- Ivanov, S., & Webster, C. (2019). Perceived appropriateness and intention to use service robots in tourism. In *Information and Communication Technologies in Tourism 2019: Proceedings of the International Conference in Nicosia, Cyprus, January 30–February 1*, 2019, 237-248, Springer International Publishing. https://doi.org/10.1007/978-3-030-05940-8\_19
- Kaushik, A.K., Agrawal, A.K., & Rahman, Z. (2015). Tourist behaviour towards self-service hotel technology adoption: Trust and subjective norm as key antecedents. *Tourism Management Perspectives*, 16, 278-289. https://doi.org/10.1016/j.tmp.2015.09.002
- Kim, S.S., Kim, J., Badu-Baiden, F., Giroux, M., & Choi, Y. (2021). Preference for robot service or human service in hotels? Impacts of the COVID-19 pandemic. *International Journal of Hospitality Management*, 93, 102795. https://doi.org/10.1016/j.ijhm.2020.102795
- Koenig, H.G., & Al Zaben, F. (2021). Psychometric validation and translation of religious and spiritual measures. *Journal of Religion and Health*, 60(5), 3467-3483. https://doi.org/10.1007/s10943-021-01373-9
- Kim, M.J., Chung, N., & Lee, C.K. (2011). The effect of perceived trust on electronic commerce: Shopping online for tourism products and services in South Korea. *Tourism Management*, 32(2), 256-265. https://doi.org/10.1016/j.tourman.2010.01.011

- Lee, Y., Lee, S., & Kim, D.Y. (2021). Exploring hotel guests' perceptions of using robot assistants. *Tourism Management Perspectives*, 37, 100781. https://doi.org/10.1016/j.tmp.2020.100781
- Leung, X.Y., Zhang, H., Lyu, J., & Bai, B. (2023). Why do hotel frontline employees use service robots in the workplace? A technology affordance theory perspective. *International Journal of Hospitality Management*, 108, 103380. https://doi.org/10.1016/j.ijhm.2022.103380
- Lu, L., Cai, R., & Gursoy, D. (2019). Developing and validating a service robot integration willingness scale. *International Journal of Hospitality Management*, 80, 36-51. https://doi.org/10.1016/j.ijhm.2019.01.005
- Maltagliati, S., Rebar, A., Fessler, L., Forestier, C., Sarrazin, P., Chalabaev, A., & Cheval, B. (2021). Evolution of physical activity habits after a context change: The case of COVID-19 lockdown. *British journal of health psychology*, 26(4), 1135-1154. https://doi.org/10.1111/bjhp.12524
- Maryati, T. (2020). Consumer behavior changes post pandemic COVID-19. *International Journal of Halal Research*, 2(2), 84-89. https://doi.org/10.18517/ijhr.2.2.84-89.2020
- Nam, K., Dutt, C.S., Chathoth, P., Daghfous, A., & Khan, M.S. (2021). The adoption of artificial intelligence and robotics in the hotel industry: prospects and challenges. *Electronic Markets*, 31, 553-574. https://doi.org/10.1007/s12525-020-00442-3
- Nguyen, V.T., Phong, L.T., & Chi, N.T.K. (2023). The impact of AI chatbots on customer trust: an empirical investigation in the hotel industry. *Consumer Behavior in Tourism and Hospitality*. https://doi.org/10.1108/cbth-06-2022-0131
- Rasheed, H.M.W., He, Y., Khizar, H.M.U., & Abbas, H.S.M. (2023). Exploring Consumer-Robot interaction in the hospitality sector: Unpacking the reasons for adoption (or resistance) to artificial intelligence. *Technological Forecasting and Social Change*, 192, 122555. https://doi.org/10.1016/j.techfore.2023.122555
- Reis, J., Melão, N., Salvadorinho, J., Soares, B., & Rosete, A. (2020). Service robots in the hospitality industry: The case of Henn-na hotel, Japan. *Technology in Society*, 63, 101423. https://doi.org/10.1016/j.techsoc.2020.101423
- Tung, V.W.S., & Au, N. (2018). Exploring customer experiences with robotics in hospitality. *International Journal of Contemporary Hospitality Management*, 30(7), 2680-2697. https://doi.org/10.1108/ijchm-06-2017-0322
- Tuomi, A., Tussyadiah, I.P., & Stienmetz, J. (2021). Applications and implications of service robots in hospitality. *Cornell Hospitality Quarterly*, 62(2), 232-247. https://doi.org/10.1177/1938965520923961
- Tussyadiah, I.P., & Park, S. (2018). Consumer evaluation of hotel service robots. In *Information and Communication Technologies in Tourism 2018: Proceedings of the International Conference in Jönköping, Sweden, January 24-26, 2018*, 308-320, Springer International Publishing, https://doi.org/10.1007/978-3-319-72923-7 24
- Pani, A., Mishra, S., Golias, M., & Figliozzi, M. (2020). Evaluating public acceptance of autonomous delivery robots during COVID-19 pandemic. *Transportation research part D: transport and environment*, 89, 102600. https://doi.org/10.1016/j.trd.2020.102600
- Pelit, E., & Katircioglu, E. (2022). Human resource management studies in hospitality and tourism domain: a bibliometric analysis. *International Journal of Contemporary Hospitality Management*, 34(3), 1106-1134. https://doi.org/10.1108/ijchm-06-2021-0722
- Pizam, A., Ozturk, A.B., Balderas-Cejudo, A., Buhalis, D., Fuchs, G., Hara, T., & Chaulagain, S. (2022). Factors affecting hotel managers' intentions to adopt robotic technologies: A global study. *International Journal of Hospitality Management*, 102, 103139. https://doi.org/10.1016/j.ijhm.2022.103139
- Polat, İ., Erdoğan, D., & Sesliokuyucu, O.S. (2021). The Impact of Attitude and Subjective Norm on Airline Passengers' Travel Intention in the Covid-19 Era: Mediating Role Of Perceived Risk. *Anais Brasileiros De Estudos Turísticos-ABET*. https://doi.org/10.34019/2238-2925.2021.v11.33307
- Pillai, S.G., Haldorai, K., Seo, W.S., & Kim, W.G. (2021). COVID-19 and hospitality 5.0: Redefining hospitality operations. *International Journal of Hospitality Management*, 94, 102869. https://doi.org/10.1016/j.ijhm.2021.102869
- Prince, M., Davies, M.A., Cleveland, M., & Palihawadana, D. (2016). Here, there and everywhere: A study of consumer centrism. *International Marketing Review*. https://doi.org/10.1108/imr-06-2014-0205
- Shimmura, T., Ichikari, R., Okuma, T., Ito, H., Okada, K., & Nonaka, T. (2020). Service robot introduction to a restaurant enhances both labor productivity and service quality. *Procedia CIRP*, 88, 589-594. https://doi.org/10.1016/j.procir.2020.05.103
- Raj, M., & Seamans, R. (2019). Primer on artificial intelligence and robotics. *Journal of Organization Design*, 8, 1-14. https://doi.org/10.1186/s41469-019-0050-0
- Roca, J.C., García, J.J., & De La Vega, J.J. (2009). The importance of perceived trust, security and privacy in online trading systems. *Information Management & Computer Security*. https://doi.org/10.1108/09685220910963983
- Wang, L.H., Ho, J.L., Yeh, S.S., & Huan, T.C.T. (2022). Is robot hotel a future trend? Exploring the incentives, barriers and customers' purchase intention for robot hotel stays. *Tourism Management Perspectives*, 43, 100984. https://doi.org/10.1016/j.tmp.2022.100984
- Yang, Y., Yang, M., Shen, C., Wang, F., Yuan, J., Li, J., & Liu, Y. (2020). Evaluating the accuracy of different respiratory specimens in the laboratory diagnosis and monitoring the viral shedding of 2019-nCoV infections. *MedRxiv*, 2020-02. https://doi.org/10.1016/j.xinn.2020.100061
- Zhang, L., Darzi, A., Ghader, S., Pack, M.L., Xiong, C., Yang, M., & Hu, S. (2020). Interactive covid-19 mobility impact and social distancing analysis platform. *Transportation Research Record*, 03611981211043813. https://doi.org/10.1177/03611981211043813
- Zhong, L., Coca-Stefaniak, J.A., Morrison, A.M., Yang, L., & Deng, B. (2022). Technology acceptance before and after COVID-19: notouch service from hotel robots. *Tourism Review*, 77(4), 1062-1080. https://doi.org/10.1108/tr-06-2021-0276

Article history: Received: 12.02.2024 Revised: 23.04.2024 Accepted: 20.05.2024 Available online: 07.06.2024