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The effect of pandemic and website information on consumers' perceived satisfaction in the hotel industry: An exploratory study focusing on e-marketplace consumers in South Korea

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ABSTRACT

The emergence of the e-marketplace and the Pandemic have had both large and small effects, especially on the tourism and hotel sector. Although several studies have analyzed consumer satisfaction, the impact of the Pandemic on consumers' satisfaction in the e-marketplace environment has received much less attention. Therefore, this study aims to investigate consumers' perceived satisfaction with their accommodation during the COVID-19 outbreak by analyzing website information provided by consumers and hotels. This study examines star rating as a moderating effect on consumers' perceived satisfaction and the impact of the Pandemic. This study collected data from the Coupang travel platform, one of Korea's largest e-marketplaces, and 1,018 responses were used. Based on the OLS regression approach, the results state that consumers' perceived satisfaction differs before and during COVID-19. In addition, there is a moderating effect of star rating, and perceived satisfaction tends to decrease as the star rating increase. Furthermore, the volume of reviews and hashtags that consumers and hotels provide positively affect perceived satisfaction. This study provides new insights into the e-marketplace approach, considering website information in the tourism literature from an e-business perspective.

Keywords: e-marketplace, perceived satisfaction, website information, hotel industry, Pandemic.

INTRODUCTION

The Internet has had a vast and pervasive impact on many industries, one of which is emerging online marketplaces. An online marketplace or e-marketplace is a fast-growing digital store; virtual stores outperform offline stores, where offline stores have turned into online stores (Christian, Chandra, 2021). In today's technology, e-marketplace has taken over stores worldwide and made all offline stores online. Nevertheless, because of the large number of consumers who go from offline shopping to online, the purchased products are not necessarily following the consumer's wish, so the consumer sends feedback or reviews to the e-marketplace (Book et al., 2018). Consumer reviews or feedback significantly impact e-marketplaces because consumers who use the e-marketplace can see and assess whether it can be trusted. So that other consumers also believe in the feedback from other consumers (Castelli et al., 2017).

E-marketplace in hospitality and tourism has progressed in recent years from the prior sales of less-complex products such as accommodations, airline tickets, and car rentals to embracing more complex products, including vacation packages and cruises (Beldona, 2005; Inversini & Masiero, 2014; Nusair & Parsa, 2011). Specialized travel platforms such as Booking.com or TripAdvisor have also raised and received much attention from travelers. With the rapid development and popularization of e-commerce technology, more and more users like to shop on various e-commerce platforms (Yang et al., 2020). However, as the products on e-commerce platforms are full of varieties and styles, consumers started to choose platforms and products based on their subjective factors.

From the perspective of hotel products in the generalized e-marketplace, hotel companies secure many consumers within a short period without marketing expenses or considerable efforts to overcome NO-SHOW and low season (Song et al., 2018). In this regard, the generalized e-marketplace is an optimal environment for consumers to purchase hotel products by utilizing deals that offer discounts on various hotel products and building a channel to talk with others by considering previous consumers' ratings and reviews. However, previous studies are limited to only studying purchase intention and satisfaction for overall products of social commerce (Lee & Lee, 2016; Han et al., 2012) or specialized travel platforms. Therefore, research on the hotel perspective in the generalized e-marketplace is insufficient.

Furthermore, COVID-19 has impacted almost every aspect of the hotel business (Gossling et al., 2020). Owing to the unique features of the Pandemic, such as its long duration, large externalities, and broad impacts, COVID-19 has affected the decision-making of consumers more significantly than other crises of the same nature (Song et al., 2022). Although there have been several studies on the analysis of consumer satisfaction, the impact of COVID-19 on consumers' satisfaction has barely started to investigate. It is essential to examine dimensions of satisfaction from online consumers' reviews to recognize their evaluations of the hotels' services during COVID-19.

Considering the external factors that consumers will be affected by in the e-marketplace environment, this study aims to reveal consumers' perceived satisfaction with their accommodation during the COVID-19 outbreak by analyzing website information provided by consumers and hotels. In addition, this study investigates whether star rating has a moderating effect on consumers' perceived satisfaction. While previous studies focused on analyzing consumers' satisfaction with specialized travel platforms, this study tries to fill a research gap by collecting data from a generalized e-marketplace platform and exploring to be generalized to other contexts in a big e-commerce concept. Furthermore, other studies have mainly concentrated on investigating only consumer-based content, such as online reviews and standardized ratings posted on online platforms, as the primary forms of User-Generated-Content (UGC). This study shed some light on considering both contents provided by consumers and hotels.

Based on the above discussion, this study attempts to answer two research questions: (1) How do e-marketplace consumers perceive satisfaction with hotel products before and during COVID-19 considering the moderating effect of star rating? (2) What kind of hotel website information affects consumers' perceived satisfaction? To address these questions, this paper is organized as follows: the literature review explains the motivations of the study by reviewing related literature; the methodology introduces a conceptual model, data acquisition and collection, measurement, and data analysis; the result provides the regression analysis results considering both main and moderating effects. Moreover, in the end, the discussion and conclusion are successively presented, including theoretical, managerial implications, and limitations.

LITERATURE REVIEW

Discrepancy Theory

Discrepancy theory research studies the difference between an a priori state and subsequent perception (Jiang et al., 2012). A discrepancy is a perceived difference between an anchor and a personal understanding of accomplishment along the same dimension. The anchor can be set by social pressure, established employment goals, personal expectations, threshold requirements, free markets, or any agency or existing bias (Michalos, 1985). Depending on the theory, the perceived discrepancy can result in several effects, including an adjustment or dismissal of the anchor, a change in the perception of accomplishment, or a resulting belief that may lead to a particular attitude or action. The magnitude and direction of the discrepancy assist in determining the level of satisfaction.

According to the discrepancy theory, an individual is more likely to feel a sense of happiness when they judge that they are superior to others (the target of comparison). Applying this to our study, we expect that, in a difficult situation due to COVID-19, the act of rejuvenating people by leaving their homes and visiting external tourism elements can provide people with a sense of happiness compared with those who are normally staying. Therefore, regardless of the external tourism factor (hotel) condition, it can be predicted that visiting a hotel in a difficult situation caused by COVID-19 will increase people's subjective satisfaction more during COVID-19 than before COVID-19.

Consumer Satisfaction and Hotel Attributes during Pandemic

Consumer satisfaction and dissatisfaction have been an essential topics in the hospitality sector. In this sector, service quality or satisfaction is critical (Rauch et al., 2015), and it is the gap between perceived and expected service quality (Padma & Ahn, 2020). Traditionally, service quality was assessed by different attributes, such as location, room service, cleanliness, comfort, the attitude of staff, booking process, and complaint handling. Song et al. (2022) found that hotel consumer satisfaction and its influencing factors have changed significantly during the Pandemic; hotel consumer satisfaction during the Pandemic is mainly influenced by service quality. In a similar context, Nilashi et al. (2021) stated that the service quality during the outbreak is essential for consumers and has impacted their satisfaction levels during the COVID-19 outbreak. Through sentiment analysis, Mehta et al. (2021) found a significant drop in the satisfaction level during April, May, or June when perhaps fear due to the COVID-19 Pandemic was at its peak. The analysis revealed that staff, overall service, cleanliness, room, booking experience, and time are the primary sources of dissatisfaction. Considering the moderating role of crisis response strategy, Yu et al. (2020) stated how the hotel industry has adopted strategies to shape consumers' experience and satisfaction. They suggested that 'rebuild strategies' dominated most hotels' response to the COVID-19 crisis, while the quantitative findings confirm the direct impact of affective evaluation and cognitive effort on consumer satisfaction.

Equity Theory

The Equity theory captures the concept of fairness perception, which has been used to explain how consumers respond to recovery efforts (e.g., Alexander, 2002; Sabharwal et al., 2010). In other words, equity incorporates a concept of a continuum ranging from the transaction-specific state (the state when a relationship has been started) to the state when the relationship has been accumulated over a long period. Hence, we assert that equity theory provides an understanding of consumers' subjective perception of their outputs and inputs. Specifically, consumers will feel fairness depending on how they perceive the gain

(output) compared to what they put (inputs) for their hotel stay. The input level would differ depending on the star rating, the possibility of reasonably matching the input and output levels will decrease. Therefore, through this theory, we assert that consumers who reserve the higher the star rating accommodation, the higher the probability of feeling unfairness of experienced output from consumers.

Country and Platform based Consumers Satisfaction

Consumers from different cultures have different services and amenity expectations; therefore, their overall positive and negative sentiments will vary with the same type and level of services. In this regard, Peres and Paladini (2022) focused on identifying the main negative topics related to the quality of hotel services in Brazil and the impacts of the COVID-19 Pandemic on guests' perceptions of these topics from the TripAdvisor database. They identified 13 topics related to five attributes of hotel service quality. Specifically, the topics related to room cleaning and check-in were the most negatively impacted by the COVID-19 Pandemic, with the largest drops in average evaluation scores. From the Taiwan perspective, Lin and Chen (2022) examined international tourist hotels with high product varieties from the government's database. Five-star hotels suffered a greater loss in revenue than other types of hotels, while hotels located in scenic areas and international chain hotels were less affected. Nilashi et al. (2021) revealed travelers' satisfaction in Malaysian hotels during the COVID-19 outbreak from the TripAdvisor source. They provided evidence that the impact of the quality of services during COVID-19 on the relationship between service and satisfaction is high.

South Korea (hereafter, Korea) is where the e-marketplace environment is very well developed, and consumer involvement in the EWOM (electronic word of mouth) system is prevalent. The Korean e-marketplace environment is worth considering for general e-marketplace shoppers in the hotel sector. Plus, e-marketplaces in Korea provide a well-built EWOM system (Yoo et al., 2015). Based on the above discussion, this study focused on the Korean environment as an appropriate environment for this study and an adequate representation of the e-marketplace. Table 1 presents the relevant literature summary that we mentioned as follows.

Table 1: Relevant literature summary

Studies	Main Theme	Platform	Geography	Major Findings
Yu Song et al. (2021)	This study explores the difference between the influencing factors of consumer satisfaction before and during the COVID-19 outbreak.	CTrip	Chengdu (China)	Hotel consumer satisfaction and its influencing factors have changed significantly during the Pandemic; hotel consumer satisfaction is mainly influenced by service quality.
Mihir P. Mehta, Gopal Kumar & M. Ramkumar (2022)	This study aims to assess consumer satisfaction by conducting sentiment analysis of continents from January to September 2020, i.e., during the COVID-19 Pandemic.	TripAdvisor	USA, UK, India, Indonesia, Malaysia, Singapore, Sri Lanka	There was a significant drop in the satisfaction level during April, May, or June when perhaps fear due to the COVID-19 Pandemic was at its peak. The analysis revealed that staff, overall service, cleanliness, room, booking experience, and time are the main sources of dissatisfaction.
Meng Yu et al. (2022)	This study examines how the hotel industry has adopted strategies to shape consumers' experience and satisfaction.	TripAdvisor	-	'Rebuild strategies' dominated most hotels' response to the COVID-19 crisis, while the quantitative findings confirm the direct impact of affective evaluation and cognitive effort on consumer satisfaction.
Clerito Kaveski Peres and Edson Pacheco Paladini (2022)	This study is dedicated to identifying the main negative topics related to the quality of hotel services in Brazil and the impacts of the COVID-19 Pandemic on guests' perception of these topics.	Booking.com	(Respondent) Brazilian	A total of 13 topics [1] related to five attributes of hotel service quality were identified. The topics related to room cleaning and check-in were the most negatively impacted by the COVID-19 Pandemic, with the largest drops in average evaluation scores.

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[1] Bathroom in the room, room facilities, noise, room cleaning, bed, internet-TV, parking lot, infrastructure, check-in, reservation, staff, restaurant, and breakfast

Mehrbakhsh Nilashi et al. (2022)	This study aims to present a new method combining machine learning and survey-based approaches for consumer satisfaction analysis during the COVID-19 outbreak.	TripAdvisor	-	The influence of service quality during COVID-19 on hotel performance and consumers' satisfaction was elaborated. The textual reviews show that the service quality during the outbreak is important for the consumers and has impacted their satisfaction level during the COVID-19 outbreak.
Yu-Chen Lin & Chiang-Ming Chen (2022)	This study examines whether different hotel characteristics moderate the impact of the COVID-19 Pandemic on hotel performance.	International Tourist Hotels	Taiwan	International tourist hotels with high product varieties and five-star hotels suffered a greater loss in revenue than other types of hotels. In contrast, hotels located in scenic areas and international chain hotels were less affected.
Mehrbakhsh Nilashi et al. (2021)	This study aims to reveal travelers' satisfaction with Malaysian hotels during the COVID-19 outbreak through online consumers' reviews.	TripAdvisor	Malaysia	The results show high impact of service quality during COVID-19 on the relationship between service and satisfaction.

The previous studies reported a significant difference in hotel consumer satisfaction before and during COVID-19. In particular, by analyzing online reviews and ratings before and during COVID-19, consumers' overall satisfaction was significantly higher during the COVID-19 outbreak. As a cause of this, some studies pointed out that consumers' standards for hotel performance criteria are changing due to various external factors of COVID-19. However, the apparent lack of research raises the question of whether consumers who purchase hotel products on e-marketplaces other than specific travel platforms such as TripAdvisor show the same satisfaction pattern. In particular, it is necessary to examine what external information is recognized by consumers who purchase accommodations from different countries on platforms commonly used in that specific country and whether this significantly affects their perception of satisfaction later.

METHODOLOGY

Conceptual Model

In this paper, we present a conceptual model depicting the effect of the Pandemic and website information on perceived satisfaction. Star rating is also considered a moderating effect between the impact of the Pandemic and perceived satisfaction. We divide informants into consumers and hotels from the website information. The information provided by consumers includes online reviews written by previous consumers. The information provided by hotels has the photo volume and hashtag volume uploaded to the platform. The region and COVID-19 severity were also set as control variables to reduce the location effect of the tourist attraction. The conceptual model is presented in Figure 1.
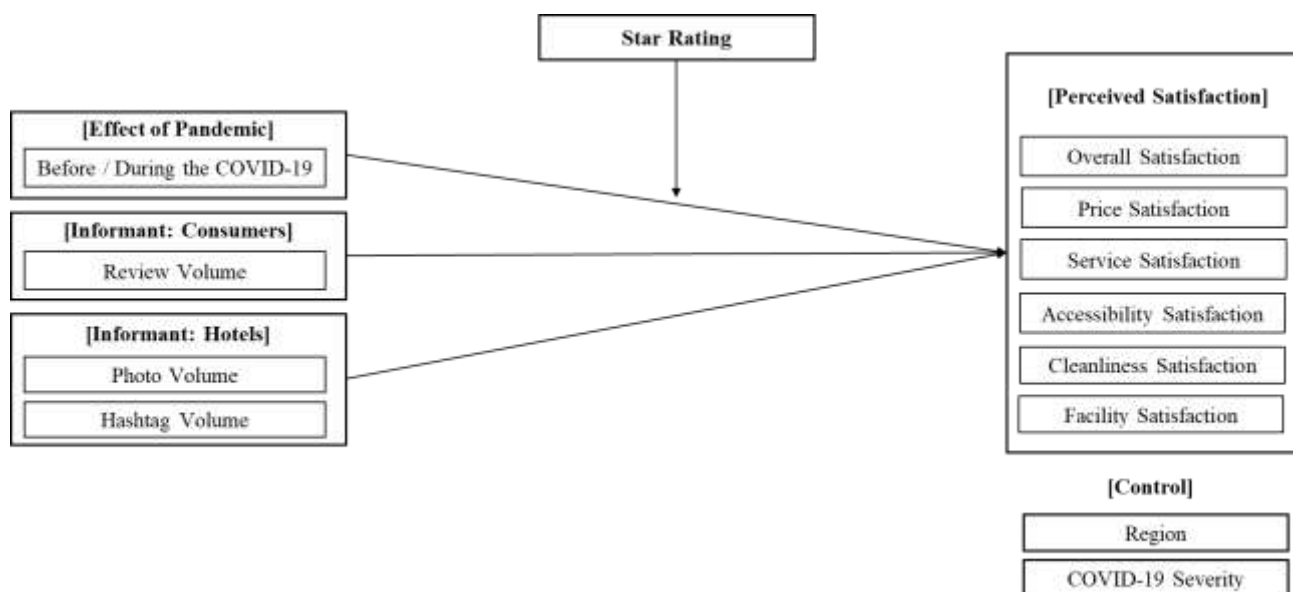

Figure 1: Conceptual model

Data Acquisition and Collection
Website information was collected from the Coupang travel platform, one of Korea's largest e-marketplaces. As the purpose of our study is to investigate satisfaction patterns in hotel products in the e-marketplace, Coupang is appropriate for the aim of this study. The data from Coupang has been used in prior studies. Kim et al. (2015) investigated the impact of motivations on consumer satisfaction in the mobile tourism shopping context. They reported that many respondents (29.1%) named Coupang their favorite site over any other single site. Furthermore, Kim (2013) stated that given the rapid growth of social commerce sites such as Coupang, it has become important to explore consumer purchasing behavior in a social commerce environment.

Coupang travel is a specialized category for Coupang's travel products, providing a variety of tourism products. In this regard, Coupang travel suggests various hotel products, including hotel reservation services. Through this service, potential consumers can use this platform as a free search tool to scan hotel information and reserve the hotels with additional benefits that Coupang provides. One advantage of this platform is that it implements single and multi-rating systems, allowing consumers to choose which method they want to adopt actively. Both reviews and ratings provided by consumers can be checked in real-time. The platform only allows reviews to be sent to people who have paid for the reservation. For this study, responses of consumers who responded with the multi-rating system were only extracted. Data collection on the Coupang travel took place in an automated way. For this purpose, a crawler was developed and implemented in the Python programming language. All responses of multi-rating systems in the Coupang travel platform were extracted; therefore, the start date varies according to each hotel, and the end date was August 4, 2022.

Measurement
To address our research question, we used a novel proprietary dataset from Coupang travel comprising highly detailed information on hotel products. We collected cross-sectional information on hotel products and the ratings from the multi-rating system. Based on these steps, our dataset contained a total of 1,018 responses which consisted of 509 hotel products * two situations (whether it is under Pandemic condition or not).

In line with previous literature, this study defined January 2022 as the start of the Pandemic since the media was already reporting hundreds of COVID-19 cases in several countries, and the news was already causing great concern in the hospitality industry (Peres, Paladini, 2022). In the case of Korea, the Korean government established a COVID-19 monitoring and response system on January 3. Thus, we defined a dummy variable, COVID-19, assigned the value of 1 during COVID-19 (2020 ~) and 0 before COVID-19 (~2020).

Considering that the importance given by consumers to quality attributes may vary according to social and environmental factors in each context, the set of attributes from Coupang travel is used to evaluate consumers' perceived satisfaction. For each hotel product, we collected information about review volume from consumers with experience staying at the hotel, photo volume, and hashtag volumes each hotel offers. The key outcome variables for this study are each specific rating from the multi-rating system. Detailed ratings (or satisfaction type) are overall satisfaction, price satisfaction, service satisfaction, accessibility satisfaction, cleanliness, and facility satisfaction.

In addition, we collected several characteristics that can measure the severity of the Pandemic: the number of confirmed cases, fatalities, fatality rate, and region. Specifically, in this study, the number of confirmed cases indicates a cumulative confirmed case during COVID-19. The number of fatalities indicates a cumulative fatality during COVID-19. The fatality rate provides the ratio of fatalities to confirmed cases in each region. The region shows the area where a hotel is located. We used these variables as control variables and collected data from KDCA (Korea Centers for Disease Control and Prevention) database. The KDCA has been updating detailed adverse events data daily in Korea (Kim et al., 2021).

Table 2 shows a detailed description of the variables used in this study. Table 3 shows descriptive statistics for continuous variables.

Table 2: Description of study variables

Variables	Description
Key explanatory variables	
COVID-19	Whether it is under COVID-19 situation (2020 ~ = 1, ~ 2020 = 0)
Star	A rating of 1 to 5 according to hotel quality
[Informant: Hotels]	
Photo volume	How many photos were offered by hotels
Hashtag volume	How many hashtags were offered by hotels
[Informant: Consumers]	
Review volume	How many reviews were written by consumers
Dependent variables	
Overall satisfaction	An overall evaluation of the hotel

Price satisfaction	A specific evaluation of the consumer's price satisfaction relative to the hotel service
Service satisfaction	A specific evaluation of the consumer's service satisfaction from the hotel
Accessibility satisfaction	A specific evaluation of the hotel accessibility
Cleanliness satisfaction	A specific evaluation of the hotel cleanliness
Facility satisfaction	A specific evaluation of the hotel facility
Control variables	
Number of confirmed cases	A cumulative confirmed case of COVID-19
Number of fatalities	A cumulative fatality by COVID-19
The fatality rate	The ratio of fatalities to confirmed cases
Region	The area where a hotel is located

Table 3: Descriptive statistics for continuous variables

Variables	Obs.	Mean	Std. Dev.	Min	Max
Star	1,018	3.27	0.96	1	5
Review volume	1,018	52.49	131.29	1	1879
Photo volume	1,018	40.77	31.23	4	225
Hashtag	1,018	4.63	2.17	1	12
Overall satisfaction	1,018	2.69	2.09	0	5
Price satisfaction	1,018	2.69	2.08	0	5
Service satisfaction	1,018	2.72	2.11	0	5
Accessibility satisfaction	1,018	2.76	2.15	0	5
Cleanliness satisfaction	1,018	2.69	2.13	0	5
Facility satisfaction	1,018	2.6	2.09	0	5

Data Analysis

We made a regression approach to investigate the relationship between the Pandemic condition and each type of satisfaction with control variables. Specifically, we estimate the following ordinary least squares regression, including region-fixed effect with robust standard errors. We assume the following causal relationship between the impact of the Pandemic and perceived satisfaction:

$$Perceived\ Satisfactions_{i,j} = \beta_0 + \beta_1\ Covid19 + Region_j + \gamma\ CV_{i,j} + \varepsilon_{i,j} \tag{1}$$

In Eq. (1), the dependent variable is each perceived satisfaction from the multi-rating system against hotel product i with region j. *Perceived Satisfactions*$_{i,j}$ consists of six satisfactions, which are overall, price, service, accessibility, cleanliness, and facility ratings Overall satisfaction is our main dependent variable in this study, and it represents the average value of all other satisfactions when customers evaluate hotels in a multi-rating system. Additionally, we investigate each of the specific satisfactions which are for price, service, accessibility, cleanliness, and the facility as dependent variables to investigate how the overall satisfaction is driven by specific satisfactions as it is average value. We also investigate how the Pandemic situation affects each specific satisfaction. *Covid19* is the main explanatory variable representing the Pandemic situation. It indicates whether customer reviews are written before or during the COVID-19 situation. We included region j to control the location effect for the same brand hotels located in different regions. $CV_{i,j}$ indicates control variables representing the other information from consumers and hotels. We also include variables which are the number of confirmed cases, the number of fatalities, and the fatality rate to control the severity of COVID-19 in each region in this model.

Next, we employ the star rating, which indicates a rating of 1 to 5 according to hotel quality, to measure the moderating effect. Each hotel has a rating evaluated for hotel quality and is displayed on the website information. We assume that star rating moderates the relationship between the Pandemic impact and perceived satisfaction. We put the variable "star" and "covid19 times star" as an interaction term in Eq. (1). The following equation indicates the moderating effect model:

$$Perceived\ Satisfactions_{i,j} = \beta_0 + \beta_1\ Covid19 + \beta_2\ Star_{i,j} + \beta_3\ Covid19 * Star_{i,j} + Region_j + \gamma\ CV_{i,j} + \varepsilon_{i,j} \tag{2}$$

We expect β_3 shows a significant relationship, which means hotels with higher star-level moderate the relationship between the COVID-19 and perceived satisfaction.

RESULTS

This section presents the results of the estimations. We present the ordinary least squares results (OLS) in Table 4. Based on Eq. (1), column (1) describes the model of each variable's effect on overall satisfaction which is our main dependent variable with control variables and fixed effect. Columns (2) to (6) provide the results of how the Pandemic situation affects price satisfaction, service satisfaction, accessibility satisfaction, cleanliness satisfaction, and facility satisfaction respectively. The results in columns (1) to (6) consistently show that COVID-19, review volume, and hashtag volume are statistically significant.

Specifically, COVID-19 significantly and positively affected all satisfaction types, consistent with the previous literature. A potential explanation for this result is that when consumers evaluate the satisfaction of each factor for a hotel, they are aware of the COVID-19 situation and evaluate it in consideration of this condition. Looking into each column, the coefficients (β) of COVID-19 are 1.087 for overall satisfaction, 1.123 for price satisfaction, 1.079 for service satisfaction, 1.177 for accessibility satisfaction, 1.056 for cleanliness satisfaction, and 1.031 for facility satisfaction, at less than a 1% significance level. The results in columns (2) to (6) also show that all specific satisfactions are positively affected by the Pandemic situation. These results suggest that the increase in all specific satisfactions drives the increase in overall satisfaction. The coefficients show the effect on accessibility satisfaction as the largest in magnitude, while the coefficient of COVID-19 investigates the effect on facility satisfaction as the smallest in magnitude.

Moreover, review and hashtag volumes significantly and positively impacted all consumers' perceived satisfaction. Regarding the review volume, results show that it has a positive effect on consumer satisfaction. Looking into each column, the coefficients (β) of review volume are 0.0183 for overall satisfaction, 0.0185 for price satisfaction, 0.0179 for service satisfaction, 0.0181 for accessibility satisfaction, 0.0186 for cleanliness satisfaction, and 0.0180 for facility satisfaction at less than 1% significance level. The coefficients of hashtag volume also provide that it has a positive and significant impact on consumer satisfaction. The coefficients (β) of review volume in each column are 0.278 for overall satisfaction, 0.280 for price satisfaction, 0.283 for service satisfaction, 0.291 for accessibility satisfaction, 0.288 for cleanliness satisfaction, and 0.287 for facility satisfaction at less than 1% significance level. Also, the results above suggest that the positive effect on overall satisfaction by review and hashtag volumes is driven by the positive effects of review and hashtag volumes on all the specific satisfactions. The review and hashtag volume coefficients in columns (1) to (6) are slightly different in magnitude. However, their differences could be neglectable as they are low differentiation. The photo volume did not significantly impact consumers' perceived satisfaction with this model.

In short, the results in Table 4 show that COVID-19 positively affects overall and other satisfactions. Website information from consumers and hotels also positively and significantly affects perceived satisfaction during the Pandemic outbreak.

Table 4: The impact of COVID-19 on hotel satisfaction

Dependent Variable	(1) Overall Satisfaction	(2) Price Satisfaction	(3) Service Satisfaction	(4) Accessibility Satisfaction	(5) Cleanliness Satisfaction	(6) Facility Satisfaction
COVID-19	1.087***	1.123***	1.079***	1.177***	1.056***	1.031***
	(0.116)	(0.115)	(0.117)	(0.119)	(0.118)	(0.116)
Review volume	0.0183***	0.0185***	0.0179***	0.0181***	0.0186***	0.0180***
	(0.00311)	(0.00309)	(0.00305)	(0.00318)	(0.00318)	(0.00303)
Photo volume	0.134	0.136	0.120	0.104	0.0952	0.0988
	(0.0830)	(0.0830)	(0.0845)	(0.0860)	(0.0857)	(0.0843)
Hashtag volume	0.278***	0.280***	0.283***	0.291***	0.288***	0.287***
	(0.0258)	(0.0254)	(0.0256)	(0.0262)	(0.0265)	(0.0258)
COVID-19 severity control	o	o	o	o	o	o
Region control	o	o	o	o	o	o
Constant	-15.53	-15.29	-31.59	-4.183	-15.49	21.01
	(143.0)	(143.2)	(144.2)	(143.3)	(142.5)	(140.9)
F-value	26.13***	27.00***	29.94***	31.91***	28.83***	28.82***
Observations	1,018	1,018	1,018	1,018	1,018	1,018
adj. R-squared	0.2359	0.2428	0.2358	0.2431	0.2336	0.2365

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Next, we investigate the moderating effect of star rating on the relationship between COVID-19 and each consumer's perceived satisfaction. We estimate Eq. (2) to test the moderating effect and report the results in Table 5. Table 5 includes the COVID-19 variable, star, which indicates star rating, and the interaction between them (COVID-19*Star). Columns 1 to 6 present the regression results with various control variables and the fixed effect.

The coefficients of COVID-19 were positively and significantly associated with all consumers' perceived satisfaction at less than a 1% significance level. However, the interaction effect (captured by the coefficient of the interaction term) is significantly negative. Specifically, looking into columns (1), (2), (3), and (5), the coefficients of interaction terms are negative and significant, which are -0.245 for overall satisfaction, -0.230 for price satisfaction, -0.230 for service satisfaction, and -0.242 for cleanliness satisfaction at less than 5% significance level. Also, Columns (4) and (6) show the coefficients of interaction terms are negative and significant, which are -0.244 for accessibility satisfaction and -0.214 for facility satisfaction at less than a 10% significance level. Moreover, consistent with Table 4, the review volume and hashtag volume coefficients in Table 5 are positive and significant at less than a 1% significance level. Also, the coefficient of photo volume shows it is insignificant, which suggests no relationship between photo volume and consumers' perceived satisfaction in this model.

The above finding suggests that website information still positively and significantly relates to consumers' perceived satisfaction and the higher star rating of hotels weakens the positive correlation between the Pandemic and consumers' perceived satisfaction.

Table 5: Moderating effect of star rating

Dependent Variable	(1) Overall Satisfaction	(2) Price Satisfaction	(3) Service Satisfaction	(4) Accessibility Satisfaction	(5) Cleanliness Satisfaction	(6) Facility Satisfaction
COVID-19	1.889***	1.877***	1.877***	1.898***	1.847***	1.730***
	(0.396)	(0.393)	(0.396)	(0.419)	(0.405)	(0.396)
Star	0.298***	0.300***	0.293***	0.266***	0.273***	0.279***
	(0.0827)	(0.0815)	(0.0824)	(0.0863)	(0.0844)	(0.0820)
COVID-19*Star	-0.245**	-0.230**	-0.244**	-0.220*	-0.242**	-0.214*
	(0.115)	(0.114)	(0.115)	(0.120)	(0.117)	(0.115)
Review volume	0.0187***	0.0189***	0.0183***	0.0184***	0.0189***	0.0184***
	(0.00308)	(0.00306)	(0.00302)	(0.00314)	(0.00314)	(0.00300)
Photo volume	0.124	0.125	0.110	0.0949	0.0862	0.0885
	(0.0828)	(0.0829)	(0.0845)	(0.0861)	(0.0857)	(0.0842)
Hashtag volume	0.266***	0.266***	0.271***	0.280***	0.277***	0.274***
	(0.0263)	(0.0259)	(0.0262)	(0.027)	(0.0270)	(0.0263)
COVID-19 severity control	o	o	o	o	o	o
Region control	o	o	o	o	o	o
Constant	-17.38	-17.19	-33.40	-5.832	-17.15	19.24
	(142.8)	(142.7)	(144.1)	(143.0)	(142.3)	(140.6)
F-value	25.04***	25.87***	27.62***	28.57***	26.53***	27.09***
Observations	1,018	1,018	1,018	1,018	1,018	1,018
adj. R-squared	0.2438	0.2511	0.2433	0.2488	0.2396	0.2435

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

DISCUSSIONS

Theoretical contribution

Previous literature has adopted quantitative approaches to assess consumers' perception of core hotel attributes during the Pandemic. Exploring consumers' satisfaction has mainly focused on analyzing online reviews and ratings through text-mining approaches on travel platforms. However, this study filled the research gap by making significant theoretical contributions to extant tourism literature from an e-business perspective.

First, our study contributes to the existing consumers' perceived satisfaction during the Pandemic in the hotel sector by identifying the relationship between COVID-19 and various website information that both consumers and hotels have provided. This study highlighted the importance of information that has been provided by hotels, not only the information provided by consumers. The Pandemic is a once-in-a-century global crisis, which provides an important and valuable research context, especially for the tourism sector. This study innovates in detecting how various online information, not only consumers' online reviews, impact consumers' perceptions.

Second, this study newly extracted the data from the Coupang travel platform, from the perspective of the e-marketplace, which had not been considered yet, and used it for research analysis. As the form of e-business gradually diversifies, we tried to consider heterogeneity among online users. Therefore, we classified and analyzed consumers from an e-marketplace, and these attempts offer new possibilities for the generalization and expansion of existing research results.

Third, in addition to expanding the scope of website information and datasets that will affect consumers' satisfaction, it was designed to add further knowledge about existing studies in consideration of previously unobserved cases in Korea. Korea is one of the representative countries where online activities are active and recognized as an exemplary quarantine and response to the Pandemic. Looking at consumers' perceived satisfaction in such an environment, while the influence of other factors on COVID-19 can be relatively minimal, this case can be the group that can observe the relationship between website information and perceived satisfaction relatively clearly in the Pandemic situation.

Practical contribution
This study provides several important practical insights for hotel practitioners regarding information management responses to the Pandemic. During COVID-19, the tourism and hospitality market has influenced the most among other sectors. The uncertainty in this sector has led decision-makers to try to design long-term schemes that survive during the current crisis. Consumers' experiences reflected by online opinions and ratings are vital for both decision-makers to enhance their services and for other consumers to reach the right choice (Nilashi et al., 2022).

From this perspective, this study yields valuable insights for hotel IT managers on how to take appropriate strategies for providing their photos and hashtag information. Specifically, the number of reviews and hashtags significantly positively affected consumers' satisfaction perception, confirming that hotel managers should try to provide more detailed hotel-related information to consumers. In addition to managing online review information from other consumers who are in the same position, hotel managers should recognize that potential consumers are also paying attention to small details such as hashtags provided by hotels.

Second, especially in the e-marketplace platforms, this study allows hotel representatives to consider consumers by platform type. Specifically, hotel representatives may consider understanding the characteristics of consumers according to the platform the hotel is promoting. This effort will provide opportunities for hotels to find similarities and differences among consumers on different platforms and how to market depending on the targets.

Third, maintaining the quality of the provided services was indicated as an essential driver of consumers' perceived satisfaction in this study. It is found that consumers not only evaluate themselves when evaluating the attributes of a hotel, but also the overall impact of COVID-19 and the environment are affected either consciously or unconsciously. This is referred to the fact that consumers are worried about their safety and health, which presents significant insights for hotel managers. It is expected that even after the Pandemic ends, attribute measures will be essential dimensions in the quality of the services, in which hotel managers will be more flexible to unexpected conditions.

Limitations of research and future work
Although this research has several theoretical and practical contributions, the research also has a few limitations that should be addressed and allows future research directions to be followed. First of all, a major assumption of this study is that there is no difference in the services provided by hotels before and during the Pandemic. Therefore, in order to make this assumption strong, it is necessary for researchers to examine whether each hotel provided services of the similar quality.

Also, one of the contributions of this study is that it deals with the dataset of the e-marketplace platform rather than the existing specialized travel platform. However, there is a limitation of this dataset as the small sample size. In particular, the proportion of the e-marketplace platform's consumers is not large enough in terms of the hotel sector. Therefore, it is necessary to utilize more accumulated datasets in the future.

In addition, according to the dataset's characteristics, only national consumers were considered in this study. In the future, using the global e-marketplace dataset will help broaden this research field's generalization. Furthermore, it analyzed only the perceived satisfaction of consumers of e-marketplace and did not perform a comparative analysis with other platform consumers. An additional comparison process will help researchers ensure the study results' robustness.

Finally, it would be a good approach to collect primary data such as interviews or surveys from relevant reviewers from the platform and compare them with online data results. While this study only focused on establishing variables by volume for each information, the text-based analysis could be helpful in the future.

CONCLUSION
This study explored the impact of COVID-19 and website information on consumers' perceived satisfaction in the hotel industry. It shed some light on investing whether star rating has a moderating effect on consumers' perceived satisfaction. While previous studies focused on analyzing consumers' satisfaction with specific travel platforms, this study tried to fill a research gap by collecting data from an e-marketplace platform and providing exploration to be generalized to other contexts in a big e-commerce concept.

Consequently, the results stated that consumers' perceived satisfaction differed before and during COVID-19. There was a moderating effect of star rating, and perceived satisfaction tended to decrease as the star rating increased. Furthermore, the

volume of reviews and hashtags that consumers and hotels provided positively affected perceived satisfaction. Even though there are some basic assumptions and limitations, this study emphasizes the necessity of exploring the e-marketplace approach, considering website information in the tourism literature from an e-business perspective.

REFERENCES

Alexander, E. C. (2002). Consumer reactions to unethical service recovery. Journal of business Ethics, 36(3), 223-237.

Beldona, S. (2005). Cohort analysis of online travel information search behavior: 1995-2000. Journal of Travel Research, 44(2), 135-142.

Book, L. A., Tanford, S., & Chang, W. (2018). Customer reviews are not always informative: The impact of effortful versus heuristic processing. Journal of Retailing and Consumer Services, 41, 272-280.

Castelli, M., Manzoni, L., Vanneschi, L., & Popovič, A. (2017). An expert system for extracting knowledge from customers' reviews: The case of Amazon. com, Inc. Expert Systems with Applications, 84, 117-126.

Christian, Y., & Utama, Y. (2021, August). Issues and determinant factors of customer feedback on e-commerce (e-marketplace). In 2021 International Conference on Information Management and Technology (ICIMTech) (Vol. 1, pp. 234-239). IEEE.

Gössling, S., Scott, D., & Hall, C. M. (2020). Pandemics, tourism and global change: a rapid assessment of COVID-19. Journal of sustainable tourism, 29(1), 1-20.

Han, S. L., Kim, J. S., Lee, B. H., Kim, S. S., & Lee, S. H. (2012). Influence of attitude toward social-commerce on the intention of usage and intention to word-of mouth. Journal of Product Research, 30(7), 161-175.

Inversini, A., & Masiero, L. (2014). Selling rooms online: The use of social media and online travel agents. International Journal of Contemporary Hospitality Management.

Jiang, J. J., Klein, G., & Saunders, C. (2012). Discrepancy theory models of satisfaction in IS research. In Information systems theory (pp. 355-381). Springer, New York, NY.

Kim, M. A., Lee, Y. W., Kim, S. R., Kim, J. H., ki Min, T., Park, H. S., ... & Chang, Y. S. (2021). COVID-19 vaccine-associated anaphylaxis and allergic reactions: consensus statements of the KAAACI Urticaria/Angioedema/Anaphylaxis Working Group. Allergy, asthma & immunology research, 13(4), 526.

Kim, M. J., Chung, N., Lee, C. K., & Preis, M. W. (2015). Motivations and use context in mobile tourism shopping: Applying contingency and task–technology fit theories. International Journal of Tourism Research, 17(1), 13-24.

Kim, S., & Park, H. (2013). Effects of various characteristics of social commerce (s-commerce) on consumers' trust and trust performance. International Journal of Information Management, 33(2), 318-332.

Lee, Y. J., & Lee, T. H. (2016). The effect of purchasing characteristics of social commerce sites on satisfaction, trust and behavioral intention of the tourism product purchasing customers. Journal of Hospitality and Tourism Studies, 18(1), 63-82.

Lin, Y. C., & Chen, C. M. (2022). How do hotel characteristics moderate the impact of COVID-19 on hotel performance? Evidence from Taiwan. Current Issues in Tourism, 25(8), 1192-1197.

Mehta, M. P., Kumar, G., & Ramkumar, M. (2021). Customer expectations in the hotel industry during the COVID-19 Pandemic: a global perspective using sentiment analysis. Tourism Recreation Research, 1-18.

Michalos, A. C. (1985). Multiple discrepancies theory (MDT). Social indicators research, 16(4), 347-413.

Nilashi, M., Abumalloh, R. A., Alghamdi, A., Minaei-Bidgoli, B., Alsulami, A. A., Thanoon, M., ... & Samad, S. (2021). What is the impact of service quality on customers' satisfaction during COVID-19 outbreak? New findings from online reviews analysis. Telematics and Informatics, 64, 101693.

Nilashi, M., Abumalloh, R. A., Minaei-Bidgoli, B., Zogaan, W. A., Alhargan, A., Mohd, S., ... & Samad, S. (2022). Revealing travellers' satisfaction during COVID-19 outbreak: moderating role of service quality. Journal of Retailing and Consumer Services, 64, 102783.

Nusair, K., & Parsa, H. G. (2011). Introducing flow theory to explain the interactive online shopping experience in a travel context. International Journal of Hospitality & Tourism Administration, 12(1), 1-20.

Peres, C. K., & Paladini, E. P. (2022). Quality Attributes of Hotel Services in Brazil and the Impacts of COVID-19 on Users' Perception. Sustainability, 14(6), 3454.

Rauch, D. A., Collins, M. D., Nale, R. D., & Barr, P. B. (2015). Measuring service quality in mid-scale hotels. International Journal of Contemporary Hospitality Management.

Sabharwal, N., Soch, H., & Kaur, H. (2010). Are we satisfied with incompetent services? A scale development approach for service recovery. Journal of Services Research, 10(1).

Song, J. H., Kim, S. H., & Jeong, U. (2018). A study on how the users' acceptance attitude toward social commerce selling hotel products affects on trust and usage intention: Using extended technology acceptance model. Korean J. Hosp. Tour, 27, 85-101.

Song, Y., Liu, K., Guo, L., Yang, Z., & Jin, M. (2022). Does hotel customer satisfaction change during the COVID-19? A perspective from online reviews. Journal of Hospitality and Tourism Management, 51, 132-138.

Yang, L., Li, Y., Wang, J., & Sherratt, R. S. (2020). Sentiment analysis for E-commerce product reviews in Chinese based on sentiment lexicon and deep learning. IEEE access, 8, 23522-23530.

Yoo, C. W., Kim, Y. J., & Sanders, G. L. (2015). The impact of interactivity of electronic word of mouth systems and E-Quality on decision support in the context of the e-marketplace. Information & Management, 52(4), 496-505.

Yu, M., Cheng, M., Yang, L., & Yu, Z. (2022). Hotel guest satisfaction during COVID-19 outbreak: The moderating role of crisis response strategy. Tourism Management, 93, 104618.