



# An Approach of the Big Data Analysis on Customer Satisfaction in Bali's Luxury Hotels and Resorts Through Wellness Attributes

Angellie Williady and Hyun-Jeong Ban<sup>(✉)</sup>

School of Global Studies, Kyungsung University, Busan 48434, Korea  
hyeonhwa00@kyungsung.ac.kr, helenaban@ks.ac.kr

**Abstract.** Tourism is one of the key pillars supporting Bali's economy and due to the COVID-19, it was facing a major drop. However, starting on April 1st 2022, Bali is opening for inbound travelers with a more relaxed COVID-19-related regulation as a part of border opening in the Southeast Asian country after a decline in the number of cases. Alongside the border opening, wellness tourism is gaining popularity due to the post-pandemic trend and Bali is one of the best wellness destinations in the world. This study will be examining 7 top luxury hotels & resorts in Bali using wellness attributes. Through Google Travel's online review derived from Outscraper. To examine the attributes affecting customer satisfaction, this study utilized R program and UCINET 6.0 as part of data refining, processing and visualization. Followed by SPSS, used to perform Exploratory Factor Analysis and Linear Regression Analysis. This study will allow luxury hotels and resort managers be aware of how the wellness attributes affecting customer satisfaction and will be able to gain more financial benefit through it.

**Keywords:** Big Data · Customer satisfaction · Bali · Luxury · Hotels & Resort · Wellness

## 1 Introduction

Throughout the past few years tourism and its associated economic effects have been impacted by the globalization of the global economy as a whole [1]. According to previous study, Indonesia was one of the country that have a high tourism development in 2008 [2]. Tourism sector in Indonesia is highly important since it brings a multiplier effect on other sectors [3]. Due to the world wide COVID-19 pandemic, the tourism sectors all around the world includes Indonesia are paused [4]. However, the president of Indonesia Jokowi explains to the people to not be afraid and to step into the new normal with productivity and optimism [5].

Bali tourism have been contributing to about 55% of Bali's total GDP [6]. As one of the favorite travel destination in 2015 [7], Bali is a mix of culture, people, nature, activities, weather, foods, nightlife and astonishing accommodations [8]. As one of the most visited tourist destination in the world, Bali it was completely paused due to the COVID-19 pandemic [6]. However, starting from 14 October 2021 Bali is slowly losing

their international travel regulations [9] and more relaxed regulations on visiting Bali is implemented for ease of travel as well.

The COVID-19 pandemic brings the society into experiencing stress due to high restriction on social activities and with it the trend of wellness tourism has a potential to develop during this transition into the new normal [10]. Previous study mention that wellness tourism means visiting natural, beautiful and cultural destination to escape the tension of daily life [11]. It was also mentioned in previous study that the amount of money that people spent in health and wellness tourism is 61% higher than general tourism [12]. Previous study state that there are four elements that Bali have that make it accessible for wellness tourism development, which are (1) Nature, (2) Social, (3) Culture, and (4) Tourism [13].

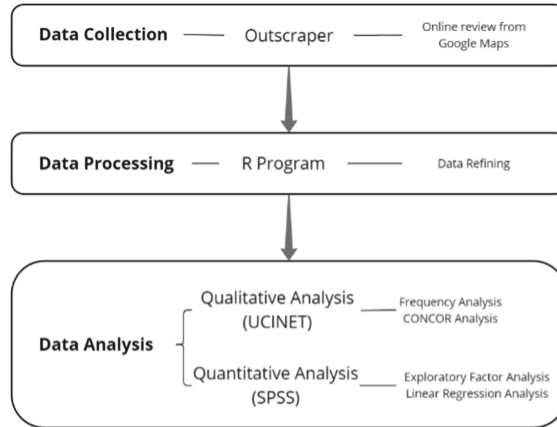
There are many previous studies mentioning wellness tourism and the attributes of it, however in this study we will be utilizing the wellness attributes towards online review of luxury hotels and resorts in Bali. Previous study by Park et al. [13] uses customer online reviews from luxury hotels in New York City (NYC) to measure the relationship between wellness attributes and customer satisfaction and dissatisfaction. The wellness attributes in that are utilized in the study was adopted from a study by Mueller & Kaufmann (2001) that mentioned there are six wellness attributes which are (1) physical fitness, (2) beautify care, (3) nutrition and diet, (4) mental activity and education, (5) rest and meditation and (6) social contacts and environmental sensitivity.

In the web page of Bali.com there is a specific section dedicated for luxury hotels & resort in Bali. This study will be utilizing the top 7 luxury hotels and resorts in Bali based on this web page. Through this 7 hotels and resorts online review, this study will be adopting qualitative and quantitative analysis to discover how the wellness attributes affects customer satisfaction in the hotels and resorts. A semantic network analysis will be conducted to extract the high frequency words and the relationship between words. Followed by a linear regression to see how are the wellness attributes affecting the customer satisfaction. This study will be a offering the luxury hotels and resorts a creative way to utilize Bali's charm as a wellness destination through this wellness attributes analysis.

## 2 Research Method

The data were collected using Outscraper which is an API tool to scrape data from the google maps [16]. Each review contains a set of information which includes hotel name, author's title, review text, and review rating (scale of 1–5). The data for this study are collected from 2018–2022 with consideration of 2 years before the pandemic and 2 years during the pandemic. The result of the data scraping and refining, a total of 7995 online reviews are utilized in this study. There will be three steps in this study which are data collection, data processing and data analysis (Handani et al., [16]; Gelen et al., 2022) (Fig. 1).

There will be three different data analysis that are conducted for this research, namely frequency analysis, CONCOR analysis and Quantitative analysis. Frequency analysis and CONCOR analysis are conducted to find the key words affecting customer satisfaction and to uncover the pattern among connected words [19]. There will be two quantitative analysis which are Exploratory Factor Analysis and Linear Regression Analysis.



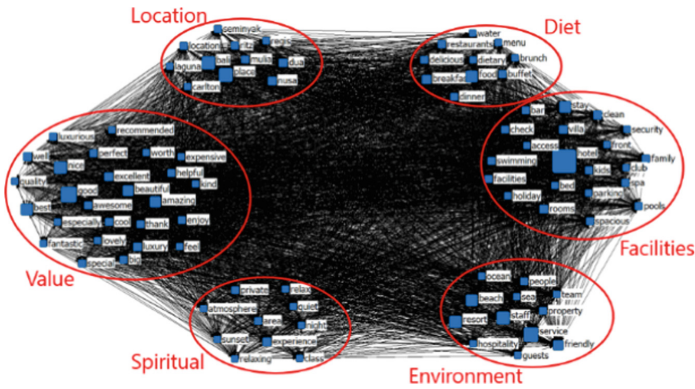
**Fig. 1.** Research Procedures

Exploratory Factor Analysis is a process of variable reduction to find commonalities between variables and Linear Regression Analysis is conducted to see how are each variables affecting the overall customer satisfaction [20].

### 3 Result and Discussion

First result being the top frequency words, the top 10 most frequent mentioned words in the online reviews are “hotel”, “good”, “service”, “place”, “staff”, “bali”, “nice”, “resort”, “food”, and “beach”. All of the top 10 words are the reflection of different attributes of hotel and resort. Using the top frequency words, there are six cluster created from the CONCOR analysis. CONCOR analysis shows the relationship pattern between words, it forms cluster that includes keywords with similarities to each other [21]. In this study, it is separated to six cluster which are location, diet, facilities, environment, spiritual and value. The three cluster in this study namely diet, spiritual and environment are part of wellness attributes that are mentioned by pervious study (Park et al., [13]) (Fig. 2).

Quantitative analysis through factor analysis is also perform to explain the correlation between various independent variables and dependent variable observed in this study. Table 1 shows the result of the factor analysis performed with a KMO (Kaise Meyer Olkin) Value of 0.653 which is above the standard that is acceptable for this study which is 0.6. The Bartlett’s test result ( $X^2$ ) is 6,345, with overall significance of the correlation matrix ( $p < 0.001$ ). In this case, there was no identity matric produced by the data, and the distribution of the data was multivariate normal in nature. In accordance with the factor analysis result, there are six factors affecting Guest Satisfaction (GS): “location (L)”, “spiritual (S)”, “diet (D)”, “environment (E)”, “facility (F)”, and “value (V)”. Consequently, the total top keywords in CONCOR of 90 was reduced to 17 words through factor analysis (see Table 1).



**Fig. 2.** Visualization of CONCOR Analysis

**Table 1.** Exploratory Factor Analysis Result

Factor	Words	Factor Loading	Eigen Value	Cum. Variance
Location	Nusa	0.944	2.754	16.198
	Location	0.920		
	Dua	0.834		
Spiritual	Private	0.901	2.452	30.623
	Atmosphere	0.844		
	Relax	0.764		
Diet	Food	0.952	2.131	43.158
	Dietary	0.946		
	Delicious	0.492		
Environment	Ocean	0.779	1.613	52.647
	Stay	0.602		
	Staff	0.458		
Facility	Parking	0.788	1.142	59.367
	Spa	0.640		
	Restaurant	0.567		
Value	Amazing	0.679	.978	65.117
	Special	0.587		

KMO (Kaiser Meyer Olkin) = 0.653

Bartlett's chi square ( $p$ ) = 6,345.5 ( $p < 0.001$ )

$$GS = 4.976 - 0.18L + 0.009S* - 0.049D* + 0.014E* - 0.012F* - 0.046V* + \varepsilon \quad (1)$$

After factor analysis, linear regression is utilized to analyze guest experience and satisfaction. The result of the linear regression can be found in the equation above. All the six independent variables explain the variance as much as 21.2% ( $R^2 = 0.212$ ). All variables are significant at 0.001. Out of six independent variables, four variables are negatively impacting customer satisfaction. The four variables are location, diet, facility and value. There are a number of reviews mentioning how they are not satisfied with the dietary provided for example “Only issue was lack of choice of healthy options at breakfast and lunch menu lacking choice and modern dishes”. The variable “value” is also negatively impacting customer satisfaction, an example “Horrible service. Not worth it for 4 million per night.” The guest does not think their value of money that they are spending is worthy for the hotel or resort which result in dissatisfaction. There are other reviews mentioning their dissatisfaction towards the location and facility of the hotel as well. However, there are many reviews mentioning their satisfaction towards the environment and spiritual for example “Thank you for the impeccable service, delicious food, relaxing spa/meditation time, and personalized” this review mentioned that they are satisfied with the service provided which is a part of the environment and the meditation time which is part of the spiritual variable. Though there are negative reviews towards specific variable the over all rating of each hotels and resorts are all above 4.6 out of 5, which means even though there are some part of the hotels and resorts that the guest are not satisfied about, the overall product and service provide by the hotels and resorts are still fulfilling the guest satisfaction expectation.

## 4 Conclusion

This study provides an insight of how wellness attributes appear in luxury hotels and resorts in Bali. Since Bali is the worlds’ wellness destination, it is important for stakes holder in Bali to understand how the wellness attributes affecting their businesses. Not only known for wellness destination, Bali is also known for its luxury accommodations which can be seen from a specific section in one of Bali’s tourism website. One of the main findings in this study indicates the word “place”, “amazing”, “beautiful”, “clean” and “hotel” have a high frequency number in consequence of frequently mentioned by guests. We can also conclude from this study that the luxury hotels and resorts in Bali are providing quite a few wellnesses product and services which are positively improving their customer satisfaction (‘spiritual’ and ‘environment’), however there are few other reviews that mentioned their dissatisfaction towards a specific part of the hotel for example ‘location’ and ‘dietary’ choices. As for the negative number on ‘value’ shows that the guests are using a lot of value meaning words in their review when they are less satisfied, words like “not worth it”, “horrible”, “bad” are frequently and repeated used to shows their dissatisfaction towards a specific part of the hotel or resort.

The result of this study can be used by each hotel and resort managers to reevaluate their hotel or resort parts and improve it to gain more guest satisfaction which may

influence other potential guest booking intention. Even though there are certain part that are not being fulfilled by the hotel or resort, it is clear that the overall satisfaction of the luxury hotels and resorts is high (4.6/5). Even though this study has practical significance, there is limitation as well. This study focusses on luxury hotels and resorts in Bali, which does not cover the other accommodation type Bali have to sustain their wellness tourism. Future research should also conduct comparative research on different hotel or resort type such as different grade of hotel and resort or specifically accommodation that focuses on wellness product and services. It would also be promising to conduct this study with a different approach of methodology to receive a more accurate data on how wellness attributes affecting overall customer satisfaction.

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