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## MINING MEANING FROM ONLINE HOTEL REVIEWS: IDENTIFICATION OF DETERMINANTS OF (DIS-) SATISFACTION USING LATENT DIRICHLET ALLOCATION

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**Abstract:** User-generated content (UGC) is increasing, so it is critical to clearly understand what customers think about the positive and negative aspects of specific goods. Such information is crucial for customers as well as for businesses. Online reviews are a powerful tool for a deep comprehension of customer satisfaction and dissatisfaction. This research intended to recognize the sources of satisfaction and dissatisfaction among business travelers in city hotels in Serbia. A total of 5,596 online reviews from 120 city hotels in Serbia were collected. Keyword-based visualization was used to display the most frequent words related to the experience during the hotel stay, reflecting the satisfaction and dissatisfaction of consumers. Latent Dirichlet allocation (LDA) was used for grouping positive and negative reviews into various topics. Results showed that business travelers' primary satisfaction sources are "Conference facilities", "Atmosphere", "Amenities", "Accessibility", and "Location". On the other hand, the sources of dissatisfaction are "Dirtiness" and "Internet Connection". Based on the obtained results, hotel managers can direct their activities to improve the spheres that have proven to be the sources of dissatisfaction for customers.

**Keywords:** user-generated content; online review; satisfaction; dissatisfaction; business travelers

### 1. Introduction

The hotel industry is characterized by an intensive contact with customers. Nowadays, customers in hotels have free access to the Internet and can easily share their experiences. Favorable customer reviews are a unique source of information for hotels, as they are considered to be more valuable. Concretely, they can help in increasing sales and improving price premiums by reducing ambiguity and information asymmetry (Öğüt & Onur Taş, 2012; Xie et al., 2016). Online reviews have quickly emerged as a valuable resource for both guests and hoteliers. Each review contains only a few pieces of information about the hotel, but it can be useful for travelers seeking for a hotel (Chong et al., 2018; Mendes Filho et al., 2012).

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Textual elements of online reviews contain additional details about customers' evaluations, often in relation to different aspects of rated items, to justify and explain the overall ratings (Zhu et al., 2011) which summarize customers' overall impressions of the rated items.

In businesses that prioritize the market, customer satisfaction is among the most crucial results of efforts made by marketing professionals in the organization. In order to boost profitability, the organizations put efforts to enhance operations, market share and customer loyalty, which makes it clear that customers' needs must be met. Feedback from customers formed in the shape of electronic word of mouth (e-WOM) has grown into an important resource for evaluating their past and projecting their future behavior. For customers, online reviews are the easiest mean to make an objection, convey their emotions, talk about their satisfaction and evaluate a site, quality of service, hotel, or restaurant. From the perspective of the offer and the manager, online customer reviews are the best channel through which information about services, quality, and customers' needs can be obtained. This is especially important when it comes to undesirable reviews, which are about to demonstrate a real problem. A number of studies have shown that negative e-WOM has a greater likelihood to be more powerful than positive (Boo & Kim, 2013; Gruen et al., 2006; J. Lee et al., 2008). Accordingly, customer complaints provide hotels opportunity to enhance their approaches. Successively, they can achieve positive correlation between customer satisfaction and profitability. At the same time, complaints generated by customers can create an adverse reputation additionally, and thus affect hotel profitability (Huang et al., 1996).

Analyzing customer reviews by using qualitative methods can help in investigating the content that customers write. In this way, hoteliers can understand their expectations and thus try to exceed them. Using secondary data sources, such as online customer reviews, can improve services as well as effectiveness of organization (Dawson & Titz, 2012; Memarzadeh & Chang, 2015). The hospitality sector greatly benefits from the use of big data and online reviews.

Hospitality and tourism are ideal fields for the application of semantic analysis (Ma et al., 2018), as such studies can be helpful for researching various topics such as service compensation (Gour et al., 2021; Xu et al., 2019), customer characteristics (Liu et al., 2019), hotel occupancy (Ampountolas & Legg, 2021), and similar.

## **2. Literature review regarding customer satisfaction**

The hotel sector places a high priority on customer satisfaction (Jana & Chandra, 2016). Since the hotel product is a complex product that is based on experience, various reasons can cause satisfaction or dissatisfaction among customers after staying in a hotel. Therefore, it is crucial to find out what makes customers satisfied or dissatisfied. By identifying hotel services that have an impact on increasing overall customer satisfaction, hoteliers can be in a better position to formulate strategies to meet or exceed guest expectations (Qu et al., 2000). Therefore, online reviews and customer ratings of hotel services are an excellent tool because they are a new technique for surveying user satisfaction (Berezina et al., 2016; Guo et al., 2017; Kim & Park, 2017; Zhao et al., 2019).

### *2.1. Satisfaction of business travelers*

A visitant who is accommodated in a paid hotel room locally or abroad for the sole purpose of or engaging in business is referred to as a business traveler (Chan, 2004). According to Toumaala (2005), business travelers tend to have high expectations, and thus anticipate higher quality (Scott

et al., 2009) and better hotel experience (Litke, 2015). Different types of travelers have different needs. Consequently, factors that influence satisfaction/dissatisfaction are determined by the type of traveler, travel style, and previous experience (Berezina et al., 2016; G. Li et al., 2015). Based on this, it was identified that business travelers are especially worried about the appropriateness of the location and the accessibility of Internet regardless of cost (Bulchand-Gidumal et al., 2011). Demographic groups differ in their travel behavior and consumer habits (Bernini & Cracolici, 2015). Also, it is noted that expectations (Ariffin & Maghzi, 2012), travel incentives (Heung et al., 2001), selection of hotel, and service usage (McCleary et al., 1994) are influenced by a demographic group. Hence, it is important to review the fact that different groups of travelers have differences in their perception of specific hotel attributes. For those who travel on business, Petry et al. (2016) identified that fast check-in and check-out are essential because they cannot misspend their time. Additionally, business travelers are highly discontented when personnel are unpracticed and unfriendly (Banerjee & Chua, 2016). According to Joppe et al. (2001), initial hotel expectations of business guests have an impact on their satisfaction. Accordingly, business travelers will be more satisfied if hoteliers meet their expectations and impressions (Bhattacharjee, 2001).

## *2.2. Content analysis of customer satisfaction*

In their qualitative study, Sparks and Browning (2010) analyzed complaints from customers regarding services in hotels and resorts. They identified that the main reasons for complaints are room features, service, public areas, hotel class, food and beverage (F&B) quality, value, and location of the object. Through content analysis, O'Connor (2010) identified the ten most mentioned topics in hotel reviews (good service provided by personnel, object location, cleanliness, size of a room, breakfast, amenities, comfort, temperature, dirtiness, and maintenance). H. Li et al. (2013), through an analysis of hotel reviews, identified the most essential determinants of customer satisfaction in both luxurious and cheap (budget) hotels. According to the findings of the study, transportation simplicity, value for money, food and beverage (F&B) management, and convenience to destination are outstanding factors that customers reserving both budget and luxury hotels recognize as important. Levy et al. (2013) focused their study on one-star hotels and sources of dissatisfaction through content analysis. The most common dissatisfiers were regarding to front desk service, bathroom, cleanliness of a room, and noise. In Berezina et al. (2016), text mining method was used to compare reviews from satisfied and dissatisfied customers. Aspects of services present in positive as well as in negative reviews included the type of facility (such as hotel, club, and restaurant), room, furniture, staff, and sports facilities. Satisfied customers point to intangibles (such as staff), while dissatisfied customers emphasize tangible elements (furniture and finances). Xu and Li (2016) revealed antecedents of customer satisfaction and dissatisfaction in various types of hotels. Hu et al. (2019) investigated the causes of customers' complaints. They revealed ten topics and identified different sources of complaints according to hotel ratings. Their results showed that guests at high-end hotels typically have concerns about the quality of services, but those at cheap hotels are commonly irritated by building-related issues. They identified that customer discontent stemmed from more specific causes than customer satisfaction, as evidenced by the fact that there were more customer dissatisfaction variables for each category of hotels than there were for customer satisfaction. They also found that customer satisfaction/dissatisfaction factors were not weighted evenly for each type of a hotel. Chang et al. (2019) found that business travelers tend to give lower ratings, while couples generally give higher ratings, with the lowest ratings being given in July and the highest in December. The analysis showed that business

travelers more often use negative words like “unfriendly”, “terrible”, “dirty”, and similar to express their negative emotions during their stay in July. By using sentiment analysis, Wu and Zhao (2023) found that, when compared with leisure travelers, business travelers have a higher complaints index. Olorunsola et al. (2023) tried to determine which factors influence the shaping of experience in capsule hotels. Their results revealed nine topics, which are: “hotel”, “staff”, “area”, “bed”, “location”, “capsule”, “check-in”, “luggage”, and “noisy”.

### **3. Methodology**

#### *3.1. Description of sampling procedure*

The hotel industry places a strong emphasis on achieving customer satisfaction. TripAdvisor, one of the biggest online communities for travel reviews was used as a platform. A web crawler through Python script code was used for collecting data. For the purpose of this research, online textual reviews from city hotels were collected. This research included hotels in the largest urban areas in Serbia: Belgrade, Novi Sad, Niš, Kragujevac, and Subotica. Reviews were collected during July and August of 2022. There were 120 hotels included in research. Most of the hotels are located in Belgrade (86) and the smallest number of them is in Subotica (five). Only reviews of customers who marked themselves as business “travelers” were selected. A total of 5,596 online reviews were collected.

#### *3.2. Methods*

##### *3.2.1. Text pre-processing*

The obtained data are unstructured and therefore data preparation had to be done. For a number of reasons, analyzing raw text data is challenging. Firstly, the obtained textual data are formless. Secondly, not all terms in the textual data are informative, so it is necessary to carry out text cleaning (e.g., removal of stop words, words specific to the context, and names of hotels and cities). In the aim of obtaining information from text, reviews must be transformed (e.g., stemmed or lemmatized; Tirunillai & Tellis, 2012). In earlier research (e.g., T. Y. Lee & Bradlow, 2007; Tirunillai & Tellis, 2012), text pre-processing procedures included deleting non-English symbols and words, process of word tokenizing, part-of-speech tagging (POS tagging), switching out typical negative terms, and lemmatization. Lemmatization is a process of word normalization, i.e., reduction to its root form. It is a complex process because it includes the morphological analysis of the words (e.g. from the word “was”, the lemma is “to be”). After the preparation of the text, reviews were divided into subsets. Following previous research (Ho-Dac et al., 2013; Hu et al., 2019), reviews with scores of 1, 2, and 3 were classified as negative, and reviews with scores of 4 and 5 were classified as positive.

##### *3.2.2. Word frequency analysis*

In order to display the most frequent words used in customer reviews of hotels, the Mozdeh Big Data Text Analysis was used. Following the research by Xiang et al. (2015), all the words that reflected aspects of customer experience were included in the frequency analysis with a few exceptions. Firstly, generic English nouns such as “size”, “people”, “effort”, “fault”, and “city” were excluded from the analysis due to lack of specificity. Conjunctions “and”, “but”, prepositions “on”, “of”, “in”, and articles “a”, “an” and “the” were also excluded from the analysis. The word “hotel” was

excluded because the reviews referred to the hotel experience and were considered redundant. The words are ordered from those with high frequencies to those with low frequencies.

### 3.2.3. Latent Dirichlet allocation (LDA)

Latent Dirichlet analysis was applied in order to extract certain topics (dimensions) based on semantic similarity. Topic modeling enables automatic organization, understanding, searching, and summarization of large electronic databases, and can help uncover hidden topics in a document (text). LDA (Blei et al., 2003) is one of the most approved topic modeling methods and has been used in numerous studies (Annisa & Surjandari, 2019; Guo et al., 2017; Priyantina & Sarno, 2019; Sutherland et al., 2020). The LDA model has two main parameters that control the allocation, namely alpha ( $\alpha$ , intended to control topics per document) and beta ( $\beta$ , intended to control the allocation of words per topic). Griffiths and Steyvers (2004) suggest that the value of the alpha coefficient ( $\alpha$ ) be calculated through the formula  $50/k$  (where  $k$  is the number of topics), and for beta ( $\beta$ ) the value 0.1, and those parameters were set in this research. According to LDA, each review's words are taken randomly from a variety of containers, each of which holds a certain set of words. All reviews can potentially share topics, and each review has its own share of topic mixing. Topic modeling with the help of LDA permits the discovery of basic themes from huge amounts of unstructured textual data—big data. Based on the LDA approach, one can easily find a variety of topics (that is, aspects that influence the satisfaction/dissatisfaction of users of hospitality services) from a huge number of documents (that is, reviews). As an unsupervised method, LDA is very effectual, as it can be adapted to handle both large data sets and highly separated time periods with scattered data (Blei et al., 2003). In this paper, LDA was used to extract customer satisfaction/dissatisfaction dimensions from reviews. Referring to Tirunillai and Tellis (2012), a dimension can be defined as a dormant construct distributed by the vocabulary that users use to illustrate their experience, which it is called a topic in the LDA literature.

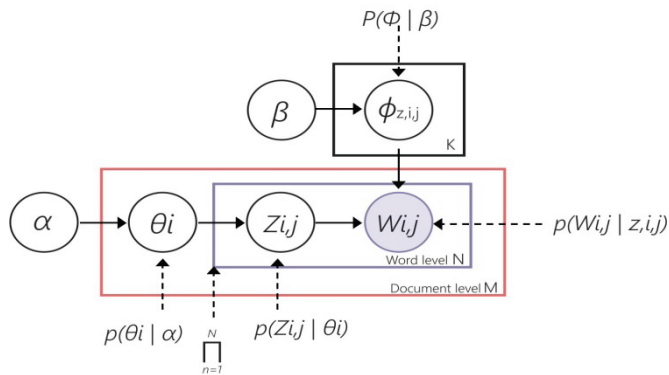


Figure 1. LDA graphic model representation.

Note. Adapted from "Mining meaning from online ratings and reviews: Tourist satisfaction analysis using latent dirichlet allocation", by Y. Guo, S. J. Barnes, and Q. Jia, 2017, *Tourism Management*, 59, p. 471. (<https://doi.org/10.1016/j.tourman.2016.09.009>). CC BY-NC.

The three hierarchies of LDA model are depicted in Figure 1 (using plate notation). While non-shadow circles  $z$  and  $\theta$  denote latent parameters, the shadow circle  $w$  represents

observable variables. Replications are shown by the boxes that are plates. The inner plate implies repeatedly selecting latent subjects and words through a document, whereas the outside plate relates to documents. At the corpus level,  $\alpha$  and  $\beta$  are hyper-parameters that are presumed to be sampled just once.

## 4. Results

### 4.1. Results of word frequency analysis of hotel reviews

The most frequent word that appears both in positive and negative reviews is “room”. This is not surprising because the hotel room is the basic component of the hotel experience. In reviews of city hotels, both positive and negative, the most frequent words were “staff”, “location”, “bar”, “bed”, “spacious”, and “free”. Since business travelers are those who most often stay in city hotels, it is expected that words related to their needs will appear frequently. One of their priorities is certainly a good location, which can affect productivity. In other words, by reducing the time necessary for traveling around the city, the amount of time spent doing work increases. According to the motive of the visit, business travelers insist on fast and efficient service, but also on free high-speed internet. It is also important for them to have attractive public spaces for relaxing activities. Upon completion of the working day, in order to rest adequately, it is necessary to provide them with a comfortable and spacious bed and a comfortable room.

**Table 1.** The 50 most frequent words in positive reviews

Word	Frequency	Word	Frequency
Room	10,352	New	2,100
Very	8,862	Modern	2,085
Staff	7,920	Recommend	2,010
Breakfast	7,026	Everything	1,977
Good	6,450	Bed	1,863
Stay	6,430	Bar	1,797
Location	6,018	Spacious	1,722
Clean	5,106	Perfect	1,662
Great	4,752	Big	1,644
Nice	4,743	Bathroom	1,641
Friendly	3,903	Day	1,575
Service	3,840	Trip	1,557
Business	3,590	Free	1,554
Restaurant	3,415	Close	1,495
Excellent	3,162	Small	1,458
Food	3,096	Price	1,437
Helpful	2,979	Area	1,371
Well	2,940	Choice	1,353
Comfortable	2,937	Spa	1,349
Time	2,706	Walk	1,320
Center	2,550	Old	1,277
Night	2,225	Reception	1,266
Really	2,202	Minute	1,236
Best	2,157	Professional	1,191
Place	2,154	Conference	1,102

The words that stood out as the most frequent from the reviews of city hotels emphasized the previously mentioned elements, which confirms their importance when staying in city hotels. It can be seen that there are a lot of positive descriptive adjectives in positive reviews, such as “good”, “clean”, “great”, “nice”, “friendly”, “excellent”, “helpful”, and “comfortable”, which indicates good experiences during the stay (Table 1).

On the other hand, in negative reviews, words such as “old”, “bad”, “noisy”, “poor”, “problem”, “average”, “smell”, “smoking”, and “impolite” often appear (Table 2). These words indicate unsatisfactory experience. In negative reviews, words related to tangible components of hotel product (e.g. “bathroom”, “bed”, “shower”, “carpet”, “furniture”, “building”, and “desk”) are present. This indicates that dissatisfaction was more caused by the intangible aspects of the hotel product. It is essential to emphasize that in the negative reviews there are also words associated with a positive experience, which indicates that during the stay there were also aspects of the hotel service that they were satisfied with.

**Table 2.** The 50 most frequent words in negative reviews

Word	Frequency	Word	Frequency
Room	674	Window	105
Breakfast	432	Area	98
Good	373	Bad	98
Location	343	Helpful	96
Stay	340	Bar	93
Staff	307	Carpet	91
Clean	251	Comfortable	90
Nice	234	Poor	89
Bathroom	212	Lobby	84
Night	211	Problem	80
Small	193	Parking	79
Food	173	Wi-Fi	77
Service	170	Quality	72
Restaurant	163	Internet	71
Business	160	Average	71
Old	156	Water	69
Place	152	Furniture	67
Bed	140	Smell	65
Friendly	138	Cold	61
Great	127	Door	60
Reception	125	Building	57
Need	122	Smoking	55
Center	118	Dinner	53
Noisy	117	Desk	52
Shower	108	Impolite	47

#### 4.2. Results of LDA of hotel reviews

By applying the LDA model (topic modeling) topics were identified that depict the satisfaction/dissatisfaction determinants with the consumption of hotel services. On the basis of ten keywords within each topic, names were assigned to the selected topics. In that way, the most essential satisfaction/dissatisfaction determinants of business travelers were determined. The topic words’ resemblance in meaning was measured by topic coherence.

The topic is more cohesive when the average pairwise similarity of words is greater (Aletras & Stevenson, 2013; Mimno et al., 2011).

Initially, a model with ten topics was tested in an effort to select the most suitable number of topics that will be used further in the research based on the coherence index. In other words, coherence value determines how easily human beings can interpret topics. Every potential number of topics had a certain coherence value. The highest score of coherence index determined the number of topics that should be extracted. Two coherence measurements, UCI (Newman et al., 2010) and UMass (Blei & Lafferty, 2005) have been developed for LDA based on human evaluations of topic quality (Stevens et al., 2012). For this study, UMass coherence score was used. It determines how frequently the words  $w_i$  and  $w_j$  occur together in the corpus and it is defined as:

$$C_{UMass}(w_i, w_j) = \log \frac{D(w_i, w_j) + 1}{D(w_i)} \quad (1)$$

where  $D(w_i, w_j)$  represents the number of times the terms  $w_i$  and  $w_j$  show up together in documents, and  $D(w_i)$  represents the number of times the word  $w_i$  appeared on its own.

LDA was conducted separately for positive and negative reviews, and the ideal number of topics was shown in Figure 2. The figure suggests that the ideal number of topics for positive reviews is five and for negative it is three.



**Figure 2.** Optimal number of topics for positive and negative reviews.

In order to easily assign names to topics, bigrams were also extracted from the reviews. A bigram is the combination of words that appear most often together. In the positive reviews of business travelers, the following bigrams were most frequent: free\_wifi, bed\_comfortable, main\_street, feel\_welcome, breakfast\_included, walking\_distance, free\_parking, business\_traveler, free\_charge, well\_equipped, breakfast\_buffet, swimming\_pool, well\_appointed, centrally\_located, value\_money, minute\_walk, front\_desk, reasonable\_price, junior\_suite, high\_quality, easy\_find, clean\_tidy, and central\_location. All the extracted bigrams point to elements that are of great



importance to business travelers during their stay, namely a good location, functional equipment, good free internet, and high quality of service.

The main reason why business travelers stay in hotels is to perform certain business activities. The results of previous studies indicate that information and communications technology (Dolnicar, 2002), business centers (Bradić et al., 2013), meeting rooms (Siguaw et al., 2006), and equipment necessary for business (Cobanoglu et al., 2003) are characteristics that improve the contentment of business travelers. According to the motive of the visit of business travelers, the first determinant of satisfaction is called "Conference facilities", based on keywords "conference", "business", "event", "meet(ing)", and "facility". "Atmosphere" appeared among the determinants of satisfaction in city hotels, which is also the case in the determinants of satisfaction of business travelers, since they are the most frequent customers of the services of city hotels. From the reviews generated by business travelers, the keywords that describe this topic are "amazing", "feel", "home", "warm", "hospitality", "atmosphere", and "welcome". Additional amenities in hotels are especially important for business travelers. They travel to perform business activities and do not have much free time. Therefore, it is very important for them that the facility where they are staying provides amenities that will allow them to relax. This topic described by keywords "fitness", "relax", "massage", "sauna", and "tub" is named "Additional amenities".

**Table 3.** Extracted determinants of satisfaction

The topic number	Extracted key words	Weight	Extracted key words	Weight	Topic name
Topic 1	Conference	0.041	Wonderful	0.013	Conference facilities
	People	0.026	Meet	0.012	
	Enjoy	0.021	Facility	0.012	
	Business	0.015	Superb	0.011	
	Event	0.015	Important	0.011	
Topic 2	Amazing	0.060	Absolutely	0.017	Atmosphere
	Feel	0.041	Atmosphere	0.017	
	Home	0.029	Place	0.016	
	Warm	0.020	Welcome	0.016	
	Hospitality	0.017	Drink	0.016	
Topic 3	Perfect	0.043	Massage	0.013	Additional amenities
	Look	0.019	Work	0.013	
	Trip	0.018	Relax	0.011	
	Fitness	0.016	Visit	0.011	
	Place	0.015	Sauna	0.010	
Topic 4	Modern	0.035	Easy	0.010	Accessibility
	Airport	0.021	Trip	0.016	
	Access	0.020	Bus	0.016	
	Price	0.020	Area	0.015	
	Downtown	0.019	Line	0.015	
Topic 5	Street	0.025	Inside	0.012	Location
	Building	0.016	Public	0.012	
	Noise	0.014	Convenient	0.012	
	Park	0.013	Park	0.011	
	Location	0.013	Outside	0.010	

The fourth topic indicates “Accessibility”, described through the following keywords “access”, “easy”, “bus”, and “line”. Location as an important element of satisfaction in city hotels appears in numerous studies (K.-W. Lee et al., 2010; Shoval et al., 2011; Tepavčević et al., 2016). Considering the results of previously mentioned research, it is not surprising that “Location” stood out as one of the determinants of satisfaction, and it was described through the following keywords: “street”, “build(ing)”, “park(ing)”, “location”, “public”, and “convenient”. Table 3 shows the extracted determinants of satisfaction of business travelers. The bigrams that appeared in the negative reviews of business travelers are the following: *business\_trip*, *smoking\_allowed*, *credit\_card*, *internet\_connection*, *staff\_friendly*, *minute\_walk*, *great\_location*, *open\_window*, *swimming\_pool*, *coffee\_machine*, and *front\_desk*.

The first topic that stands out and determines customer dissatisfaction is “Dirtiness”. Keywords that describe this topic are “poor”, “smell”, “furniture”, “carpet”, “break”, “dirty”, and “housekeeping”. The problem of dirtiness appeared in numerous studies as a source of complaints and dissatisfaction of guests (e.g. Levy et al., 2013), and the repetition of this topic as a source of dissatisfaction indicates the importance of dealing with this issue, as well as increasing the level of cleanliness in the hotel.

WiFi connectivity is a major determinant of dissatisfaction in full-service hotels (Xu & Li, 2016). Low speed, weak signal, weak connection, and extra fees lead to customer dissatisfaction. The second topic is “Internet Connection”, described through the keywords “poor”, “free”, “internet”, “slow”, “wifi”, and “connection”. The third topic was not assigned a name due to an insufficiently clear and coherent meaning (Hu et al., 2019).

**Table 4.** Extracted determinants of dissatisfaction

The topic number	Extracted key words	Weight	Extracted key words	Weight	Topic name
Topic 1	Poor	0.031	Guest	0.016	Dirtiness
	Smell	0.027	Break	0.016	
	Furniture	0.024	Dirty	0.016	
	Lobby	0.022	Need	0.015	
	Carpet	0.019	Housekeeping	0.015	
Topic 2	Poor	0.029	WiFi	0.021	Internet connection
	Free	0.027	Minute	0.021	
	Comfortable	0.026	Side	0.021	
	Internet	0.024	Connection	0.019	
	Slow	0.022	Walk	0.019	
Topic 3	Center	0.036	Side	0.021	-
	Restaurant	0.029	Close	0.019	
	Park	0.025	Town	0.019	
	Helpful	0.023	Choice	0.019	
	Average	0.022	Place	0.019	

## 5. Discussion and conclusion

This study aims to give detailed information on the key areas of business travelers’ satisfaction and dissatisfaction. When compared to research dealing with satisfaction, those focused on customer dissatisfaction with hotel services are less prevalent. It is very important to discuss the aspects of hotel services that lead to customer dissatisfaction because they

differ from those that cause satisfaction (Gu & Ryan, 2008). Uncertainty (Choi & Chu, 2001), failing to meet expectations, and service quality (Su, 2004) are a few of the major issues that have been linked to consumer dissatisfaction. Anger and regret are two emotions that might affect dissatisfaction with tourism services (Sánchez-García & Currás-Pérez, 2011), and this can have a number of unfavorable effects like complaints or unfavorable e-WOM (Cheng et al., 2005). Hotel management needs to constantly be aware of how customer demands are changing over time (Berezina et al., 2016), as well as how customers are reacting to UGC.

Many studies focused on the content analysis of hotel reviews (Arasli et al., 2023; Dinçer & Alrawadieh, 2017; Hu et al., 2019), but there is a lack of studies focused on the sources of satisfaction and dissatisfaction of business travelers. Business travelers usually express a lower level of satisfaction with hotel services (Radojevic et al., 2018) because they use hotel services more often for business reasons (Lawrence & Perrigot, 2015) compared to leisure travelers. Among business travelers, the following topics stood out from the positive reviews: 1) "Conference facilities"; 2) "Atmosphere"; 3) "Additional amenities"; 4) "Accessibility", and 5) "Location". The topic "Location" appeared in previous research (Arasli et al., 2023; Guo et al., 2017). Elements related to the atmosphere in a hotel and additional amenities were also identified as satisfiers (Guo et al., 2017). The topics named 1) "Dirtiness" and 2) "Internet Connection" reflect dissatisfaction. Internet problems have been identified as causing dissatisfaction in many studies (Kuhzady & Ghasemi, 2019; Mellinas & Nicolau, 2020; Xu & Li, 2016), and the results of this study are consistent with them. Previous research has identified criteria for choosing a hotel among business travelers, such as location, brand and reputation, the facility itself, value for money, and design of rooms (Dubé & Renaghan, 2000), while the most important attributes during the stay are the room design, the facility itself, service (interpersonal and functional), food and beverage services. The leading determinant of dissatisfaction is dirtiness (Dubé & Renaghan, 2000). The determinants that were singled out in this research reflect the needs of business travelers, and some of the previously identified factors that affect satisfaction and dissatisfaction were confirmed in this research as well. Based on the identified determinants of both satisfaction and dissatisfaction, hoteliers can make more efforts to delight their guests and reduce their dissatisfaction. The determinant that appeared in the negative reviews is the "Internet connection", and it is important to pay attention to it because it is considered a necessity nowadays. First of all, nowadays high technology is widely used, and guests rely on it a lot during their stay at the destination and in the hotel, and the use of the Internet has become an unavoidable part of life. Therefore, the improvement of this aspect can greatly affect the reduction of user dissatisfaction, and also by reducing complaints in reviews directed toward this aspect.

One of the main limitations of this research is that sole English reviews were included in the analysis. Most of the research in this area dealt with the analysis of reviews exclusively in English because the leading problem related to multilingual sentiment analysis is a dearth of lexical resources (Denecke, 2008). In addition to research in English, there are also sentiment research in Arabic (Oueslati et al., 2020), Indonesian (Fauzi, 2019), Chinese (Zheng et al., 2018), and Spanish (Molina-González et al., 2013).

Regarding customer satisfaction, an aspect that is important to observe is the cultural background of customers. Cultural differences can influence differences in required service standards (Mey et al., 2006). If expected standards are not met, there may be complaints.

Customer complaints provide hotels with the opportunity to improve their strategies, increase customer satisfaction and increase profitability. However, complaints of customers can create an unfavorable reputation and thus affect hotel profitability (Huang et al., 1996). Therefore, it is crucial for entities to have a good comprehension of the behavior of customers who complain. Future research should expand by including the cultural background, which can shape expectations to a great extent, and thus affect satisfaction or dissatisfaction with certain aspects of hotel services.

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