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Classification of customer satisfaction attributes: An application of online hotel review analysis

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Abstract. With the wide penetration of Internet, online hotel reviews have become popular among travellers. Online hotel reviews also reflect customer satisfaction with hotel services. In this study we use online hotel reviews to classify the attributes of customer satisfaction with hotel services. The empirical data was collected via Daodao.com, the Chinese affiliated brand of online travel opinion website tripadvisor.com. Based on text mining and content analysis, we found that the following seven dimensions are important attributes generating customer satisfaction with hotels: hotel, location, service, room, value, food and dinging, and facility availabilities. Finally we concluded on the research findings and also highlight the research limitations and future research directions.

Keywords: e-Service, e-Commerce, eWOM, Online reviews.

1 Introduction

The wide penetration of Internet applications in the hospitality and tourism field has greatly changed the way travelers retrieving tourism information, managing their trips, and booking flights or hotels. As Li and Liu (2014) indicated that individuals yield large amount of user generated contents (UGC) via Internet, and the UGCs spread to others via various online media, such as email, chat rooms, personal Web pages, bulletin boards, newsgroups, discussion forums, blogs, social networks, and virtual communities [1, 2, 3]. Consumers would like to rely on UGC to support their consuming decisions [1]. Since travelers can easily get access to the Internet, where they may freely express their subjective assessments, sentimental thoughts or even the emotional feelings towards the hotels, destinations, or the trip process, and share their travel experience with others, and the most important, individuals are also trying to use these travel-related UGC to support their travel decisions, such as hotels or destinations. According to Gretzel and Yoo (2008), three-quarters of travelers take online consumer reviews as the main information source when planning their trips [4].

The study by Gretzel and Yoo (2007) confirms the vital role (77.9%) of online reviews in making decision "where to stay" [5]. The similar trends also show in China. According to the recent report released by China Internet Network Research Center in 2013, 69.5% of the travelers in China considered online travel-related reviews as the essential factor supporting their hotel booking decision [6]. Information asymmetry has been dramatically eliminated [7] by referring to the UGC, such as online reviews (also named as eWOM), based on travelers' previous experience.

This growing reliance on the Internet as the information source has inversely led to the prosperous development of different online opinion facilitated websites, and inspired travelers' enthusiasm in sharing their experience. In the hospitality and tourism industry, the professional social network websites normally employ numerical rating (overall rating or rating components) and text comments with or without numerical ratings [8], such as tripadvisor.com, booking.com. The highlighted summary of the travel-related services performs like a powerful illustration of an Internet-mediated abstract system [9], or the reputation feedback system [10]. The popularity of online review makes the related websites gradually develop to be a popular intermediary in travel industry, or even a more trustful third party for individuals, when comparing to the traditional travel agents [11].

The rating system in hospitality and tourism industry, composed of rich numerical ratings and text contents from experienced travelers, can not only offers other individuals reliable information to support their travel decision, but also delivers to travel service providers, i.e. hotels, valuable feedbacks about their service quality, and even as a good marketing channel [10]. Ye et al. (2009, 2011) found that the relationship between travelers' hotel rating behavior and the room reservation performance is significant [12, 13]. A 10 percent increase in the travelers' ratings, will boost online bookings by more than five percent. Some researchers worked on the components of user satisfaction in order to better understand the factors determining hotels' service quality and user satisfaction. In practice, different online rating systems are also adopted to measure hotel's service quality, such as Tripadvisor.com, Booking.com.

Though online reviews have been argued to be important information source for both individuals and hotels, research on hotel customer satisfaction mainly focus on the attributes of service quality based on the perceptions from hotel customers, and little research has attempted to examine the attributes of hotel customer satisfaction from the perspective of online hotel review -- the real feedback of hotel customers. In addition, few studies have explored to explain the importance level of various attributes generating customer satisfaction based on online hotel reviews, which might shed light on how hotel can satisfy their customers and retain customers, as well as how to recruit customers as marketing channel for their products or services via the WOM simultaneously. Thus, it is meaningful to investigate the attributes of hotel customer satisfaction based on the online reviews from real hotel customers.

The rest of this paper is organized as follows. A literature review on hotel customer satisfaction research is presented in the next section. Section three describes the research instrument development and the collection of the data. The results are presented in section four with a discussion on the findings as well. Section five presents the conclusions in this research and followed by the discussion on research limitations and future research directions.

2 Research background

2.1 Hotel customer satisfaction

Customer satisfaction has been an important research topic in the marketing field, such as to explore customer loyalty, and purchasing intention. According to Oliver (1980), customer satisfaction refers to an attitude [14]. It is an evaluation formed by customers based on the expectations of what customers would receive from a product or service and on their perceptions on the performance of a product or service they actually received. Prior literature has attempted to identify the attributes which generate customer satisfaction as well as to identify the importance levels of different attributes in enabling user satisfaction [15]. Much of the literature researches on customer satisfaction from the lens of service quality [16]. The research on user satisfaction of hotels also follows the research tradition of customer satisfaction and investigates customer satisfaction based on service quality of hotels, mainly employing survey, interview and case study research methods [17,18]. The research stream mainly identifies the attributes of service quality. More details are presented in Table 1. Deng (2008) identified the importance level of different indicators in generating customer satisfaction based on the SERVQUAL scale [17], proposed by Parasuraman et al. (1985, 1988) [19,20]. Choi and Chu (2001) conducted empirical study in the context of hotels in Hongkong and found that staff service quality, room quality, value, general amenities, business service, IDD and security are important attributes in generating user satisfaction with hotels [18].

Table 1 Research on hotel customer satisfaction from the lens of service quality

Literature	Scales
Deng 2008 [17] Case study, and survey Hotels in Taiwan	Responsibility and empathy: Personal warm care given by staff, Have customers' best interest at heart, Easy to get staff's attention & help. Readiness to respond to customer's requests, Knowledgeable to answer customers' request, Courtesy and friendliness of staff, Individual attention for customer, Willingness to help customers, Understand the specific needs of customers, Provision of safe environment and equipment. Reliability and assurance: Provision of services as promised, Dependability in handling customers' service problem, Reasonable price, Prompt reply to customers, Perform service right at the first time. Tangibility: The physical facilities are visually appealing, Multiple hot spring facilities, Availability of adequate fire & first aids facilities and instructions, Cleanness of hot spring facilities, Convenient hotel location.
Choi & Chu 2001 [18] Survey Hotels in Hongkong	Staff service quality (efficiency in check-in/out, helpfulness of staff, politeness/friendliness of staff, neat appearance of staff, efficiency of staff), Room quality (cleanliness, comfort of bed/mattress/pillow, in-room temperature control and quietness of room) Value (room value for money, hotel food & beverage value for money, comfortable ambiance of the hotel and hotel being part of reputable chain). General amenities (availability of mini bar, variety of food and beverage facilities, quality of food and beverage facilities, reliability of wake-up call, efficiency of valet/laundry service, efficiency of room service and availability of information desk)

	Business services (availability of secretarial service, availability of business-related meeting rooms, availability of business-related facilities). IDD (International direct dial) facilities Security (responsibility of security personnel, reliability of loud fire alarms and availability of safe box)
Mey et al. 2006 [21]; Survey; Malaysia	Reliability (5 items), responsiveness (3 items), assurance (3 items), empathy (3 items), tangibles (11items)
Shanka & Taylor 2008 [15] Survey Hotels in Perth of AU	Physical facilities: personal safe, safe deposit boxes, IDD, long bath, in-house movies Service experienced: friendly front office staff, efficient check-in/check-out, 24 hour reception Service provision: taxi booking, lobby ambience, tour bookings, on-site parking
Ramanathan 2012 [22]; Regression; Hotels in UK	Physical-product management: cleanliness, room quality and family friendliness People and process management: customer service Marketing management: Value for money

2.2 Research on online hotel reviews

Online travel reviews have become popular among travelers. Traveler would like to make comments on the travel services they have experienced and share travel experience with others. The popularity of online hotel reviews offers researchers the possibility to get access to online hotel reviews generated by hotel customers, and to get the real data reflecting travelers' satisfaction, but not based on their perceptions about travel services as in the traditional research on user satisfaction.

Recently, quite much research on hotel customer satisfaction has used online hotel reviews in their research to explore user satisfaction. Though these researches are also trying to identify the indicators of customer satisfaction, the same as the traditional research, its research context and research methods are different. Normally text mining and content analysis are employed in these researches. Chaves et al. (2012) conducted content analysis of online hotel reviews on the SME hotels, and found customer satisfaction with hotel services are mainly determined by the indicators related to room, staff, location and neighborhood of hotels [23]. Zhou et al. (2014) made analysis of the online hotel reviews in a city in China and found that physical setting, (including room, hotel, and food), value, location and staff are the most important attributes generating hotel user satisfaction [24]. More detailed research based on online hotel reviews is presented in Table 2.

Table 2 Research on online hotel reviews

Literature	Scales
Chaves et al.	Room: cleanliness, size, silence and bed. Cleanliness, confort, scenery and

(2012) [23] Content analysis SME hotels	the Internet (positive), air-conditioner, bed and sound proofing (negative). Staff: friendliness and helpfulness. Knowledge and indication of sights and landmarks, foreign language skills. Professionalism (negative). Location: near the city center, proximity to access points for public transport, proximity to the beach (positive). Neighborhood: safe surroundings.
Zhou et al. (2014) [24] Content analysis Hotels in Hangzhou city, China	Physical setting –room: Amenities in the room/bathroom; size and layout of the room; cleanliness of the room; welcoming extras Physical setting – hotel: Availability of Wifi; public facilities (lounge, lobby, pool and fitting centre); dated level (old/new); noise level; entertainment facilities Physical setting – food: A variety of food (including western food); the quality of food; the dining environment; availability of special food service (room service; vegetarian and gluten free options), Value: Room price; food and beverage price, and other prices Location: Close to attractions; close to city centre; close to the airport/railway station; and accessibility Staff: Friendliness of the staff; language skills of the staff; efficiency of the staff in solving problems
Li et al. (2013) [25] Content analysis Hotels in Beijing city, China	Logistics: Transportation convenience, convenience to tourist destination Facility: room, air conditioning, network, sound insulation, TV, parking Reception services: luggage, check in/out, morning call, lobby Food and beverage management: breakfast, lunch, dinner, room service Cleanliness and maintenance: Room cleaning, bathroom, bedding replacement and bed Value: Value for money
Magnini et al. (2011) [26]; Content analysis Blogs	Customer service, cleanliness, location, value, facility, guestroom size and decor, renovation/newness, food, amenities, quietness
Lu and Stepchenkova (2012) [27] Content analysis Online review of hotels in USA	Ecology settings (grounds/surroundings, lodge amenities, ambiance, noise, ecofriendliness, other guests) Room (room/bathroom decor and layout, room amenities, room/bathroom facilities, insect problem) Nature (nature-based activities, natural attractions, weather) Services (customer service, tour/tour guider service, extra service, restaurant service, reservation service, management policy) Food quality Location (closeness to town, accessibility, closeness to attraction) Value for money (food/drink price, room rates, other price)
Stringam and Gerdes (2010) [28] Content analysis Online review of hotels in USA	Clean, staff, breakfast, bed, price, restaurant, pool, bathroom, airport, downtown, view, shopping, shower, dirt, coffee, towel, noise, smell, courteous, pillow, buffet, noisy, attractions, smoking, accommodating, pay, expensive, mall, cheap, employee, eat, rate, decor, dine, sheet, valet, Disney, toilet, clerk, refrigerator, stain, broken, bath, bus, affordable, store, cost, shops, sink dinner

3 Research methodology

3.1 Data collection

The source selection of hotel review websites is crucial to the research. The platform should be capable of assembling larger population and generating higher external validity. Based on the rule, daodao.com was finally opted for the online hotel review/eWOM data source. Daodao.com is fully affiliated to the world's largest travel site - Tripadvisor, which operates worldwide in 42 countries, and generates more than 150 million reviews and opinions covering over 4 million accommodations, restaurants and attractions. Since launched in 2009, Daodao.com has been providing valuable insights to Chinese travelers in trip planning, for example, over 3 million reviews in Chinese has been accumulated at the website of Daodao.com by February 2014. Currently Daodao is ranked as the top one tourism-related UGC website among the Chinese community. According to the iResearch statistics, the monthly visits of Daodao.com have reached 7.62 million in August 2013.

Only 4 and 5 star hotels are considered in this research.Sanya, a coastal city deemed as the oriental Hawaii in the far south part of China is selected. Sanya is the second largest city of Hainan which is an isolated island in the south sea, and is also the designated international tourism island by Chinese government in December 2009. Sanya has been a popular leisure travele destination for its tropical attractions and the yearly wide low PM2.5, when comparing with other bigger tourism cities like Beijing or Xi'an. A number of 100 top star hotels located in Sanya are registered in daodao.com, consisting 49 five star hotels and 51 four star hotels. The 100 hotels generated a total volume of 24051 reviews, with online reviews on individual hotel ranging from 2 to 1744, and averaging in 240.

All reviews are crawled from the website by using a spider program. The two-week data crawling process started from March 23, 2014, and ended in April 5, 2014. Numbers are also revised and re-crawled when there are new reviews during the two weeks.

Taking in sight that the reviewers of Tripadvisor are from 42 countries and can write reviews in 25 languages, Daodao.com merged international reviews in the general opinion pool for each hotel. Correspondingly, there are numbers of reviews written in other languages, such as English, Russian, Japanese, and so on. This portion of opinions is not considered in the research so as to neatly focus on the context of Chinese eWOM. Daodao.com also cooperates with similar review or booking brands, through borrowing travelers' opinions left in other branded websites like Expedia and Agoda. These segments are also deleted, since differed reviewing regulations in diversified platforms may deliver varied thinking. The online hotel reviews are finally purified to 19,659 items, with individual hotel reviews ranging from 1 to 1632.

3.2 Data content mining procedure

Due to the unique feature of Chinese language, one native Chinese software called ROST CM6.0 is chosen to conduct the research. ROST content miner is designed by a research group from Wuhan University in China, for the purpose of solving the

problems that other non-Chinese originated content mining software met in parsing and merging Chinese words. ROST CM6.0 is capable of splitting, filtering, merging Chinese words, and researchers can also automatically count frequencies, cluster and classify the words, construct the sentiment networks or social networks, and display the co-occurrence matrix. It has been downloaded by researchers worldwide from more than 100 universities to deal with Chinese qualitative data in social sciences.

The word parsing and initial word frequency counting is operated first, followed by the filtering stage. Though ROST CM6.0 has its own filtering dataset, the manually selected filtering lists are still needed for each individual research under its unique context. The full list of the parsed words is therefore carefully reviewed, while those words that either do not conforms to the common Chinese usage or contains no meanings under this research context are selected and added in the filtering database. When the filtering word list is done, the parsed word dataset is then re-input in the software to generate the new word frequency counts.

3.3 Data Coding

The filtered output displays a number of 1899 items of words with the frequency of 1 or above. The highest frequency climbs up to 35089, whereas a list of 812 words counts less than 10. The number of words with frequencies up from 57 takes the top 499 lists, and those ranging from 11 to 49 surmounts 588. Among the 1899 word lists, the word hotel ranks the highest, being mentioned by 35089 times. Room and service follow with the frequency of 18482 and 15111. Surroundings, amenities, convenience, breakfast, seashore, sandy beach and sea view are also the frequently used words in the top 10 lists.

Though the review portraits are sketched out by referring to the 1899 word lists, it is still far from reaching the fundamental essence. The coding process is therefore continued so as to stress out the important word groups and accordingly pinpoint the key dimensions that travelers care. The top 500 words are picked out and reviewed carefully. Through aggregating the synonyms or similar words, the 500 vocabulary is then reduced to 100 groups. The frequency of the word groups range from 56 to 37342, and average in 3300. The denomination related with hotel still ranks the first, including hotel, resort, villa and etc. Room, beach, service, location, facilities, environment, cleanness, swimming pool and price also enlist in top 10 lists. Generally speaking, the groups of words outlining the varied facets of each dimension still take the majority. Take service for instance, vocabulary pools specifically describing empathy, politeness, professionalism each take the frequency of 7670, 3735 and 2590.

In order to reveal the diversified dimensions and explain their respective significance, attribute coding is conducted according to the scales proposed by prior literature. A small number of word lists are deleted, for either they are the general denomination, such as hotel name related lists (hotel, resort, villa and etc.), or the ambiguous words that cannot unveil the real context, like lovely, delicious, tasty.

4 Results and Discussions

Based on the literature review and careful coding, the 100 word groups are categorized into seven attributes, each containing detailed indexes, as shown in Table 3. Among the seven attributes, hotel, location and room attracts the majority of the stress, respectively taking the percentage of 25.9%, 21.7% and 21.4%, which clearly reflect the travelers' willingness to stay in a conveniently located and well equipped hotel, and to enjoy the comfort of the room fully supported by the well furnished amenities. Service and food are also frequently mentioned, sharing another proportion of 22.4% in altogether. This finding also conforms to the prior research finding of Li et al. (2013) that service and food are important attributes generating customer satisfaction with hotel [1]. Surprisingly, only no more than 5% of the review words have connections with the elements of hotel value. The finding reflects the true thoughts of travelers. Travellers consider more about quality of travel service, and less on the hotel value considering the popularity of Sanya as a leisure travel tourism destination and aiming for relaxation when traveling to Sanya. The denomination regarding the general facility availabilities, ambiguous in the underneath context of either hotel or in-rooms, for instance, facilities, equipments, deployments, hardware, equipped, and etc., also counts for 3.8%, though it cannot unveil much significant findings.

In the attributes related to hotels, the index of beach and sea view far surmount the other indexes, standing over one third of review frequency in its category. This is crucial to hotels in the tropical cities like Sanya, which is also why most top star hotels locate nearby the sea to avail beautiful sea view in-rooms possible, and to run their own beach with seashore supports for enjoyment. Room rates of those hotels can even triple the price of the similar hotels which are not near the sea, since they follow the fashion and pinpoint the unique feature. The element of decoration turns to be the second important attribute related to hotels, sharing a percentage of 19.0%. This finding reveals that customers care very much about the hotel decoration. The decoration, furnishing, ornamentation of hotels can help customers to get the feeling of luxury, modern, fashionable, dated and etc. The public facilities and fitness and entertainment facilities are the two commonly mentioned indexes, individually standing for 12.5% and 15.5%. Lobbies, elevators, corridors, and facilities for children and elder people sketch out the public facilities travelers concern, whereas fitness and entertainment facilities mainly refer to fitness centers, sonar and message, bars and clubs, and swimming pools. In addition, reviewers also care about the chains or star ratings of the hotel (7.9%), revealing that endorsement based reputation can truly make some influence towards the travelers. Some reviewers also mentioned about the beautiful surroundings and ambience (7.5%) inside the hotel, such as gardens, fresh air, quietness and etc. The two non-significant yet indispensible elements, parking and in-hotel commuters and Internet facilities are also highlighted, though respectively with only 2%.

The general denomination of room has been intensely remarked in the room attribute, constituting over one third of the proportion. Nonetheless, the detailed hints regarding room facilities still draw a panoramic view. Cleanness (24.5%) and comfort of the room (22.5%) are the two vital variables to measure the perceptions customers hold towards the room, standing more than half of the detailed descriptions. To well

explain the comfort of the room, noise & quietness (16.4%) and sleep quality (9.5%) are proposed multiple times to reflect the two influencing facets. Toilet & bathroom (13.9%), furniture & electronics (12.5%) sharing the portions of 26.4% altogether, primarily emphasize the internal facilities either in rooms or in the bathroom, which can provide the solid supports to customers. Interestingly, a great number of reviewers stress out the room size and layout (23.1%), particularly referring to size, stories, balcony, casement and floor windows, space, scenery, airiness, etc. A small number of reviews comment on beddings (3.5%), including pillows, beds, sheets, and mattress. Of course, well beddings can normally bring comfortable and tight sleep.

Same as the prior literature, travelers discuss the hotel location in regard to its proximity to public transport, attractions and city centers, and its general environment. Surprisingly, travelers intently headline the surrounding environment of the hotel (51.2%), through adopting words like landscape, scenery, beautiful, tropical, greens, nature, and etc. Expectancy and conformity theory might help explain this finding. Travelers who choose the most famous tropical city of China mainly expect to experience the exotic views. Accessibility of the public transportation (22.3%) draw some heeds, while vicinity to the attractions (15.9%) follows. The proximity to city center (10.6%) is comparatively the least highlighted. This fits in the research context, since Sanya is more a tourism spot than a gigantic city with prosperous shopping malls.

The word service in single has been mentioned for 15111 times, standing nearly 38% of the service attribute, though there are many facets of service that have been highlighted. Friendliness and helpfulness (44%), and staff and professionalism (41%) are the two equally important index, stating either the consideration of the service people, i.e. warm, polite, greeting, kind, patient, attentive, smile, help and etc., or the professionalism that displays through efficient, speedy and timely service, and their neat appearance and nice manage. Front desk service and reception (11%) can also deeply impress the customers, which implies in the process of check-in/out, inquiry, complaint, room change, welcome etiquette, and etc. Pick-up service (4%) attracts the least concern, yet it is still vital for hotel.

Dining and food is also frequently mentioned. The general description regarding food, foodstuff, eating, dining, feast etc. takes some proportion (18%), and portrait the overall profile. The two elements depicting dining and food are the dining place and the contents. Food and beverage takes the transcending advantage with the percentage of 87.4%, including the variety of food (western/oriental food, buffet, breakfast/lunch/supper, seafood, cakes/fruits/ barbecue etc.), beverage (drinks, liquors, juice, coffee, etc.), and the quality of food (delicious, flavor, etc.). Breakfast attracts the highest remarks (36% out of the category), since most hotels put breakfast in the package bundle. The dining place (12.6%), namely Chinese/western restaurant and room service, also counts. Value is mainly reflected by means of perceived value (23.1%) and price (76.9%), with the former revealing the customers' perception towards value (value for money, economic, cheap, worthy, etc.), and the latter being price of room, food, service, or the discounts and freebies.

Table 3 High Frequency Review Words Coding Profile

Index	Ratio	Notes and Examples
Hotel (25.9%)		
- beach & sea view	33.5	beach, seashore, sea view, sand, sea, etc.
- decoration	19.0	renovation, furnishing, ornamentation, luxury, modern, etc.
- entertainment facilities	15.5	fitness, sonar & message, bars & clubs, swimming pools, etc.
- public facilities	12.5	lobbies, elevators, corridors, fountains, slides, toys, etc.
- star ratings	7.9	star ratings, reputation, chain, brand, 1st class, etc.
- ambience	7.5	natural ambience like gardens, fresh air, quietness, etc.
- Internet facilities	2.1	computers, Internet, cable, Wi-Fi, etc.
- parking & commuters	2.0	parking lot, in-hotel storage battery car, etc.
Location (21.7%)	36.6/-	general description, e.g. location, district, distance, etc.
- environment	32.4/51.2	landscape, scenery, beautiful, tropical, greens, nature, etc.
- close to transportation	14.2/22.3	bus, airport, railway station, walking, taxi, etc.
- close to attractions	10.1/15.9	famous scenery spots and attractions, and place for diving, etc
- close to city center	6.7/10.6	city center, shopping, supermarket, downtown, etc.
Room (21.4%)	34.5/-	general descriptions, e.g. room, guestroom, indoors, etc.
- cleanness	16.0/24.5	cleanness, cleaning, disinfection, dust,rubbish, etc.
- room size and layout	15.2/23.1	size, stories, balcony, windows, space, scenery, airiness, etc.
- comfort	14.7/22.5	quietness, sound proofing, noise, comfort
- toilet & bathroom	9.1/13.9	bathroom facilities, e.g. shower, bathtub, towel, slippers etc
- furniture & electronics	8.2/12.5	curtain, carpet, sofa & chairs, telephone, TV, cooler, etc.
- bedding	2.3/3.5	bed, mattress, pillow etc
Service (14.3%)	38/-	the single word of service for general description
- friendliness & helpfulness	28/44	warm, polite, greeting, kind, patient, attentive, smile, and etc.
- staff & professionalism	26/41	efficient, speed, timely, manage, neat appearance, and etc
- front service & reception	7/11	check-in/out, inquiry, complaint, welcome etiquette, and etc.
- pick-up service	2/4	pick-up service including shuttles, drivers, pick-up, and see-off
Dining & Food (8.1%)	18.1/-	general description, e.g. food, foodstuff, eating, etc.
- foods & beverages	71.5/87.4	variety, quality, and taste of food, drinks and liquors, etc.
- restaurants	10.4/12.6	Chinese/western restaurant and room service
Value (4.8%)		
- price	76.9	room/food charges, service fee, discounts, freebies, etc.
- perceived value	23.1	value for money, economic, cheap, worthy, etc.
Facility availabilities (3.8%)		facilities denomination ambiguous in the underneath context, such as facilities, equipments, deployments, hardware, equipped, and etc.

5 Conclusion

This research attempts to identify the attributes generating customer satisfaction with hotels based on the online hotel reviews from hotel customers. Based on text mining and content analysis, we found that the following seven dimensions are important attributes generating customer satisfaction with hotels: hotel, location, room, service, food and dinging, value, and facilities. Hotel related attributes is the most important factors travelers care about and influence customer satisfaction strongly, followed by location, room, service, food and dining, value and facility availabilities. The research finding implies that physical settings of hotel (such as hotel, room), services and location play more important role in generating customer satisfaction, whereas dining and food, value and facility availabilities are not as so important as the role of them.

The research findings also offer some practical guidelines to hotels on how to improve customer satisfaction. Providing good service and satisfying customers are always important for hotel.

6 Limitations and future research

The same as other research, this study involves some limitations that need to be acknowledged. First, this research was conducted in context of hotels in Sanya in China. This gives a possible avenue for future studies to research on hotels in different cities or different countries to see whether there is difference among varied cultural background of hotels. Second, to compare the findings of research on online hotel reviews and on traditional customer perceptions, such as survey, might also be interesting in this field.

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