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# Analysing hotel guests' online reviews on their stay in Palma de Mallorca

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hotel guests complaints, text mining technique, Booking.com, customer satisfaction, hospitality industry

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## Abstract

This BA dissertation sets out to examine the major determiners of guests' online complaints staying in 3, 4 and 5 star hotels in Palma de Mallorca using the *data mining technique*. A total of 395 reviews published in English in *Booking.com* were analysed. The results indicate that a number of improvements ought to carried out within the hotel rooms and other facilities; moreover, staff performance was also subject of discussion and criticism in some of the complaints analysed. On the other hand, the findings indicate a clear need to respond to each of the guests' complaints. This study should, therefore, be of value to hoteliers wishing to improve the service quality delivered to their customers.

## Introduction

It is a fact that the more satisfied customers are whilst staying at a hotel, the higher the chances are of them returning for another visit and/or passing their good experience on to other people who may decide to stay at that specific hotel. Therefore, it is very important for hoteliers to take into consideration customer's criticism and/or complaints in order to be able to improve and better satisfy future visitors.

*Online word-of-mouth communications* are an increasingly important area in the lodging industry since almost half of travellers shopping online report that travel reviews from other consumers influence their purchase decision (Cannizzaro, M., Carroll, W., Offutt, B., Quinby, D., Schetzina, C., & Sileo, 2008; Stringam & Gerdes, 2010).

Nevertheless, online reviews are limited by a series of biases: first, in the absence of clear incentives, users with a moderate outlook will not bother to voice their opinions; second, there is a correlation between the effort spent in writing a review and the risk perceived by the user for the corresponding

transaction; and third, rating distributions are skewed, and show how different ways of averaging ratings produce different quality estimates and different rankings of hotels (Admati & Pfleiderer, 2001; Hu, Pavlou, & Zhang, 2006; Jurca, Garcin, Talwar, & Faltings, 2010).

The purpose of this research project has been to identify the most important factors influencing hotel guests' complaints in the lodging market of Palma de Mallorca.

The data for this study, 3, 4 and 5 star hotel complaints, were collected from the travel metasearch engine *Booking.co*m. Then, the *data mining technique* has been used to identify the most common words that appear in the reviews.

This dissertation, however, has been unable to neither encompass the entire set of hotels in Palma de Mallorca nor discern between the positive and negative sentiment of the reviews analysed. To address the second limitation, reviews have been manually classified.

The overall structure of the dissertation takes the form of four sections:

The first chapter explains the most relevant emergent issues influencing *online word-of-mouth communications*, which are: factors associated with customer satisfaction, the growth of online reviews, the idiosyncrasy of negative reviews, critical performance attributes in online reviews, the delivery of managerial responses, controversy of guest complaints, hotel rating systems, travel intermediaries, emphasising Booking Holdings, and the lodging market in Palma de Mallorca.

The second section is concerned with the methodology employed for this study, i.e. compilation of hotel complaints, their processing to identify patterns and the calculation of various statistics.

The third part presents the findings of the research, focusing on three key topics: hotel statistics, reviewer statistics and the most frequent words in the reviews analysed.

The final section summarises the main findings of this project, which may be of assistance for hoteliers, and includes its limitations and some suggestions for further research on this topic.

# Literature review

## Customer satisfaction

Previous research on online reviews has revealed the emergence of several themes. Up to now, previous studies have emphasized factors that are associated with customer satisfaction, which is a business philosophy that highlights the importance of creating value for customers, anticipating and managing their expectations, and demonstrating the ability and responsibility to satisfy their needs (Dominici & Guzzo, 2010; Radojevic, Stanisic, & Stanic, 2015). Achieving and maintaining customer satisfaction is one of the greatest contemporary challenges faced by management in service industries (Radojevic et al., 2015; Su, 2004).

Early examples of research into customer satisfaction include the work carried out by the *American school*, led by Parasuraman, Zeithaml, & Berry (1985), that considers customer satisfaction as a negative or positive outcome resulting from a comparison process between initial expectations and perceived performance of products and services (Kozak & Rimmington, 2000).

On the other side, the *Nordic school*, directed by Grönroos (1990), brings a completely different perspective to measuring customer satisfaction by stating that it is only an outcome of the actual quality of performance and its perception by consumers (Kozak & Rimmington, 2000).

In the matter at hand, Bearden & Oliver (1985, cited in Jeong & Mindy Jeon, 2008) reported that both compliments and complaints played key roles in determining customers' future attitudes and purchase behaviours. Kozak & Rimmington (2000, citing Cadotte & Turgeon, 1988, and Lewis, 1983), however, pointed out that the spread of negative communication is faster than that of positive communication.

## Online reviews

In recent years, there has been an increasing amount of literature on consumer-generated media (CGM), since it is one of the fastest-growing channels of interpersonal and informal communications. The Internet is providing the momentum for the accelerated growth in popularity of these new *word-of-mouth (WOM) communications* (Jeong & Mindy Jeon, 2008).

*Online WOM recommendations* differ from *WOM recommendations* in their speed and breadth of distribution. While the former are broadcast through the Internet, the latter are often passed on from person to person. This hence makes *online WOM recommendations* unique in their impact (Stringam & Gerdes, 2010).

In the same vein, Cannizzaro, M., Carroll, W., Offutt, B., Quinby, D., Schetzina, C., & Sileo (2008, cited in Stringam & Gerdes, 2010) note that almost half of travellers shopping online report that travel reviews from other consumers influence their purchase decision. In fact, when purchasing a new product or

service, customers tend to turn to this mode of communication channel as a more reliable source of information (Folkes, 1984; Jeong & Mindy Jeon, 2008).

As for the socio-economic profile of online reviewers, Gretzel & Yoo (2008) found travellers who use travel review sites to have high incomes and to travel frequently (Stringam & Gerdes, 2010).

This increase in the availability of information results in travellers being better informed, which in turn leads to a more efficient market (Cunningham, Smyth, Wu, & Greene, 2010; Fernández-Barcala, González-Díaz, & Prieto-Rodríguez, 2010).

## Negative reviews

Some of the literature within this field acknowledges negative reviews, since they are considered more credible, altruistic, and of higher importance than positive ones, with critical reviews being more closely examined and commented (Cunningham et al., 2010; Levy, Duan, & Boo, 2013; Papathanassis & Knolle, 2011).

Indeed, Levy et al. (2013, citing Litvin, Goldsmith, & Pan, 2008, and Öğüt & Onur Taş, 2012) suggested that negative comments posted by customers can hurt a hotel's image and could easily find their way out to common interest groups in online communication sites, restricting the ability of hotels to increase price.

## Performance attributes

What we know about online guest reviews is largely based upon qualitative and quantitative studies that investigate which performance attributes evaluated in review websites are critical, and that therefore ought to be considered by the hotel management.

Hotel characteristics such as star rating, room rates, and popularity (driven by guest ratings) are to be considered, since they influence ratings of performance attributes such as rooms, value, cleanliness, and service (Jeong & Mindy Jeon, 2008; Levy et al., 2013).

Some studies have concluded that performance aspects are based on lodgement nature. Thus, upscale and luxury hotels perform better than lower rated hotels; chain-affiliated hotels perform somewhat better than independent hotels in rooms, check-in & check-out, service, and business service. Moreover, customers tend to award higher ratings to smaller hotels (Jeong & Mindy Jeon, 2008; Molinillo, Ximénez-de-Sandoval, Fernández-Morales, & Coca-Stefaniak, 2016).

Besides, a differentiation between *business travellers*, more sensitive to staff speed and efficiency, and *leisure travellers*, more apt to complain about a perceived lack of staff empathy, should be carried out (Levy et al., 2013; B. R. Lewis & McCann, 2004).

Hereunder, performance attributes are classified depending on whether they have a positive, negative or neutral relationship with a hotel's overall customer rating according to different authors:

Aspects such as *courteous*, *accommodating*, or *attentive* staff, *the presence of specific hotel amenities such as air conditioning, free Wi-Fi, and a hotel bar, the number of online customer reviews per hotel room, cleanliness and neatness of the property, bathroom, service quality, employee knowledge, spaciousness of the property, and quietness of the surrounding* have a positive relationship with a hotel's overall customer rating (Cadotte & Turgeon, 1988; Jeong & Mindy Jeon, 2008; Molinillo et al., 2016; Radojevic et al., 2015; Stringam & Gerdes, 2010).

Other aspects, like the words *refund* and *apology* appearing in online reviews, *the distance from the city centre, the number of rooms in the hotel, the general hotel price level in the city, room rate, meals or other services, speed and quality of service, parking availability, employee knowledge and service, quietness of the surrounding, and availability of accommodations* are among most frequently received complaints (Cadotte & Turgeon, 1988; Jeong & Mindy Jeon, 2008; Molinillo et al., 2016; Radojevic et al., 2015; Stringam & Gerdes, 2010).

Last but not least, *size of the guest room, breakfast, staff, location, bathroom, bed, and shower* are frequent concerns of reviewers although not positive or negative related with a hotel's overall customer rating (O'Connor, 2008; Stringam & Gerdes, 2010).

## Managerial responses

Commenting on managerial responses to guest complaints, Stringam & Gerdes (2010, citing Lewis & Pizam, 1981, and Pullman, McGuire, & Cleveland, 2005) argue that: "the best way to gain a full understanding of a customer's feelings about a hotel is to analyse the content of the customer's comments".

Thereafter, online complaints should be responded immediately and authentically, with each complaint receiving a response. Effective responses can increase positive loyalty behaviours (e.g., likeliness to recommend, return intent) by more than 20 percent (Barsky & Frame, 2009; Chan & Guillet, 2011; Levy et al., 2013; Mattila & Mount, 2003; Zheng, Youn, & Kincaid, 2009).

In numerical terms, a study carried out by Anderson (2012) and cited by Radojevic et al. (2015), reports that a 1% increase in an online rating score leads to an increase in hotel occupancy of up to 0.54% and an increase in price of 0.89%.

In a similar way, due to the fact that value is the most powerful predictor of guests' satisfaction, which in turn leads to the guest's return intentions, special efforts (i.e., marketing campaign, employee training, and value package deals) should be made by each hotel to meet or exceed guests' expectations and offer enhanced service or facility features, compared to what they have paid for (Jeong & Mindy Jeon, 2008).

## Controversy of guest complaints

Jurca, Garcin, Talwar, & Faltings, in their academic paper *Reporting incentives and biases in online review forums* (2010), analyse the controversy of guests' complaints:

- First, in the absence of clear incentives, users with a moderate outlook will not bother to voice their opinions, which leads to an unrepresentative sample of reviews (Admati & Pfleiderer, 2001; Hu, Pavlou, & Zhang, 2006).

- Second, there is a correlation between the effort spent in writing a review and the risk perceived by the user for the corresponding transaction. The underlying hypothesis is that users feel more compelled to contribute with feedback about transactions that a priori involve higher risk. As an example, users seem to recognize that high-end hotels expose the travellers to a higher risk (of taking the wrong decision) and are therefore more diligent in reviewing these hotels.

- Finally, rating distributions are skewed, and show how different ways of averaging ratings produce different quality estimates and different rankings of hotels. For example, rating averages computed based on the arithmetic mean often produce rankings that fluctuate over time; one possible explanation is that raters constantly correct the current average with exaggerated ratings. In contrast, the ranking determined by the median rating is much more stable and robust against outliers.

## Hotel rating systems

*Booking.com*, the travel metasearch engine herein used, enables hotel screening based on the star rating.

As determined by the Conselleria de Turisme i Esports (2015), the category of the hotels in the Balearic Islands is determined according to a self-assessment process performed by the establishment. Moreover, the hotel owner can choose freely the category of their establishment if it meets the minimum conditions for that category.

In accord with Nobles (1999), the 1, 2, and 3 star-rated establishments focus more on the physical facilities, while the 4 and 5 star-rated establishments do more on intensive, high level services (Jeong & Mindy Jeon, 2008).

Aside from the official star system, other rating methods rely on "experts" to evaluate and rate hotels and other forms of lodging accommodations (Haussman, 2008; Henley, Cotter, & Herrington, 2004; Stringam & Gerdes, 2010). For instance, the Michelin Hotel & Restaurant Guide, present in 24 countries, offers recommendations to hotels and restaurants and for any establishment it is a sign of prestige to be included in the guide (Feloni, 2014; Michelin, n.d.).

While Jeong & Mindy Jeon (2008) point out that the popularity index of online review sites coincides with the hotel star rating system, thus indicating that the widely adopted hotel star rating system seems to have empirical validity from guests' perspectives, Cornell Center for Hospitality Research (2008, cited in Stringam & Gerdes, 2010) questions the usefulness of governmental and expert-based rating systems. For instance, a hotel with a high rating coming from these systems may find itself with a low consumer rating, thus downgrading the potential consumer perception of the hotel.

## Travel intermediaries

Traditional sources of online hotel reviews can be traced to two categories of internet-based companies, namely, *online travel agencies* (OTAs) and *online review specialists*. OTAs have become popular electronic booking channels for website visitors by aggregating lodging options and providing consumer-generated reviews, a significant portion of which are of hotels (Levy et al., 2013).

Hence, the proliferation of hotel reviews online has mirrored the tremendous growth of hotel room bookings through e-distribution channels (Levy et al., 2013; Toh, Raven, & DeKay, 2011). According to 2018 figures, the global lodgement market accounts for more than 600,000 million dollars (Hinojosa, 2018).

Hotel professionals are doubling down on digital marketing and social partially owing to the growing market power of accommodations upstart *Airbnb* (eMarketer, 2017a), that is now drawing more traffic than any other hotel brand or metasearch site. In Q1 2017, *Airbnb* drew 106.9 million visits to its site, more than metasearch sites *Booking.com* and *Hotels.com*. *Airbnb* is also outpacing the sites of hotel brands *Marriott* and *Hilton* (eMarketer, 2017b).

Instead, *Booking.com* stands out in almost all financial metrics, such as gross bookings, revenue, profit and market capitalization (Hinojosa, 2018).

These two companies are noticeably competing with each other. *Booking.com* is aiming to accelerate its growth in the holiday home sector, whereas *Airbnb* has opened its platform to independent and boutique hotels (Hinojosa, 2018).

In addition, apart from facing *Airbnb*, hotel operators must also compete with the deep pockets of online travel agencies such as *Priceline* and *Expedia*, which spend considerable sums each year on consumer marketing campaigns while simultaneously cutting into hotel profits by charging commissions for customer referrals (eMarketer, 2017a).

Formerly, the guest comment card was used for internal quality control in hotels. Managers were only able to review their own guest comment cards, and travellers were not privy to this information. The prevalence of travel distribution over the Internet has provided hoteliers and consumers alike the opportunity to review consumer generated ratings and comments across the industry (Stringam & Gerdes, 2010). Consequently, lodging companies should promote reviews on their own sites and implement reputation management systems

such as *ReviewPro* to engage with and listen to online users (Levy et al., 2013; Zheng et al., 2009).

Another important aspect that may lead the way of intermediation is the emergence of *blockchain technology*, which can be described as an incorruptible, decentralized ledger of economic transactions that can be programmed to record anything of value, not just financial transactions. Benefits to hotels with blockchain distribution could be lower costs of acquisition and greater control over the distribution process (Hospitalitynet, 2017).

At present, businesses can see a weaker demand because of malicious and untruthful reviews, while the public has a tough time distinguishing between fake and real testimonials. *Concierge.io*, an upstart blockchain-based travel bookings platform thinking is that this technology brings "transparency and honesty to the review system," meaning vendors cannot pay for manipulated feedback and only genuine customers can leave remarks (Loum, 2018).

## Booking Holdings (previously The Priceline Group)

Having discussed the relevance of intermediaries to the lodging industry, the following section focuses more specifically on *Booking.com*, since it is the source of reviews used in this paper. *The Priceline Group* has recently changed its name to *Booking Holdings* to acknowledge the significance of its *Booking.com* service, its biggest unit and the world's top hotel-reservation service, whereas *Priceline* is notable mainly in the USA market (Levy et al., 2013; Mellinas, Martínez María-Dolores, & Bernal García, 2016; Vanian, 2018).

The rating system used in *Booking.com* is rather unusual but it presents special features. The final score published on the website is a plain average of six aspects of the hotel. Furthermore, the customer is not asked to rate each item from 1 to 10; instead, there are four options corresponding to *poor* (2.5), *fair* (5), *good* (7.5) or *excellent* (10). (Mellinas, Martínez María-Dolores, & Bernal García, 2015a; Mellinas et al., 2016)

## The lodging market in Palma de Mallorca

Some papers that have been written on online reviews include a section relating to the features of the lodging market analysed (Kozak & Rimmington, 2000; Levy et al., 2013).

Data of the year 2017 are indicating that the Balearic Islands received 16,333,781 tourists, with an increase of 6.27% over the previous year. Furthermore, foreign tourists have been crucial for the economy of our autonomous community, with 13,791,037 international tourists in 2017, ranking third in Spain (Institut d'Estadística de les Illes Balears (IBESTAT) a partir de datos de FRONTUR, n.d.).

As of 2016 there were 129 hotels representing 34,060 hotel beds in Palma de Mallorca, that is, 17.46% of the hotels and 16,29% of the hotel beds in the Balearic Islands (Institut d'Estadística de les Illes Balears (IBESTAT) a partir de datos del Observatori Turístic de les Illes Balears., 2016).

Different measurements used by hoteliers are also here exposed. In 2016, the lodging market in Palma de Mallorca registered an occupancy of 72.7% (an increase of 4.7%), whereas average daily rate increased by 2.4% and RevPAR improved by 7.2%. These figures appear to be linked to the fact that the demand has been higher than the offer (Ramón Vilarasau, 2017).

Moreover, the city is home to the headquarters of tourism companies, including some of the world's biggest hotel corporations: *Meliá Hotels International* (#16), *Riu Hotels & Resorts* (#34), *Barceló Hotel Group* (#42) and *Iberostar Hotels & Resorts* (#52) stand out in the 2016 ranking of the Hotels Magazine (2017).

By contrast, Mallorca, being a mass tourism destination, is affected by seasonality. To tackle it, a considerable number of high-end establishments known as boutique hotels, that have between 25 and 50 rooms and receive guests all year round, have been set up in the last 5 years in the centre of Palma. By doing so, the urban environment of the historical centre as well as the catering, commercial and cultural offer have improved, thus stimulating tourist deseasonalization (Hosteltur, 2013; Kozak & Rimmington, 2000; Ruiz Collado, 2017).

Besides, developments such as sports, shopping, nightlife and entertainment facilities, and the ease of getting to museums and historical places during the winter season could stimulate subsequent visits and gain new customers by word-of-mouth communication (Kozak & Rimmington, 2000).

# Methodology

## Participants

### Hotel guests

The first step in this process was to define the sample to conduct the research. It consisted of 395 hotel guests' reviews written in English and taken from *Booking.com*, of which 310 had comments available in the body of the text and 85 were blank, although they had a heading and a rate score.

Furthermore, the reviewer's name, their country of residence, their number of comments on *Booking.com*, their status on this online platform and sometimes, the guest's age group and the number of times their comment was voted as helpful by other users were also available in both filled in and blank reviews.

Of the cohort of 395 opinions, 180 were from English customers (45.57% of the reviews). This might be attributed to the fact that British tourists, whose main language is English, have been the second largest visitor group in Mallorca in 2017, with the amount of 2,311,738 tourists (Institut d'Estadística de les Illes Balears (IBESTAT) a partir de datos de FRONTUR, n.d.; Office for National Statistics, 2013)

At the same time, 30 reviews (7.59%) belonged to Spanish clients, which stand on the fourth place of the visitor ranking in Mallorca in 2017. Similarly, 20 comments (5.06%) were from German clients, the largest visitor group in Mallorca in 2017 (Institut d'Estadística de les Illes Balears (IBESTAT) a partir de datos de FRONTUR, n.d.).

To examine the role of tourists in our economy, Polo & Valle (2008) showed that the Balearic Islands is a region highly specialized in the production of services, a large extent of which are tourism services. Clearly, the peculiar structure of the Balearic Islands' economy makes it highly sensitive to a fall in non-residents' demand.

### Lodgements

The project used a sample of 52 lodgements. Criteria for selecting the establishments were as follows: hotels of 3 (7 cases), 4 (36 cases) and 5 stars (9 cases) with guest opinions scored as *very poor* (between 1 and 3 points) or *poor* (between 3 and 5 points) in the area of Palma (Mallorca).

At the time of writing this paper, *Booking.com* had 318 properties available in Palma, with an average price of € 118.11. This lodgement metasearch engine does not include Palma de Mallorca Airport, Can Pastilla, Playa de Palma or El Arenal in the search even though they are located in the area of the city (Booking.com, n.d.-a).

In any case, given the importance of city tourism, which has recently become one of the key drivers of *outbound tourism* in Europe, growing at a faster pace than *coastal tourism* (Dunne, Buckley, & Flanagan, 2007; Radojevic et al., 2015), it was decided not to include the most remote areas of the town, dedicated mainly to sun and sand tourism.

## Research material

Online guest comments studies have traditionally employed review channels such as *Booking.com*, *TripAdvisor* or *Expedia.com* (Cunningham et al., 2010; Jeong & Mindy Jeon, 2008; Levy et al., 2013; Radojevic et al., 2015; Stringam & Gerdes, 2010).

The limitation of studies based on *TripAdvisor* is the existence of content provided manipulated by malicious users and the retention of reviews on the site for years (Mellinas et al., 2016; Mellinas, Martínez María-Dolores, & Bernal García, 2015b).

In this research, *Booking.com* was chosen because it has a large market share in Europe, with a large and active community generating continually valuable feedback information (Radojevic et al., 2015). Besides, Booking archives reviews older than 24 months to keep the rating score and review content always updated, as well as only allowing reviews from customers who have booked through *Booking.com* and stayed at the property in question (Booking.com, n.d.-b).

Apart from this, and relevant to this research, is how the metasearch engine mentioned above shows the results. Properties being part of the preferred program, which are those that perform among the 30% of properties in their area and that are willing to pay a higher commission amount, appear towards the top of search results, next to a thumbs-up sign (Booking.com, n.d.-d).

Moreover, *Booking.com* has different distinctive icons at the top of property pages such as great value today (signalling value for money based on customer's expectation and competition's offer in a certain destination), couple friendly or airport shuttle (Booking.com, n.d.-c).

Regarding the process of reviewing a property on *Booking.com*, Radojevic et al. (2015) state:

> Shortly after a stay, a user is routinely invited via email to fill out a guest review form. The first part of the form allows users to evaluate the property they stayed in, using a standardised set of criteria specifically: cleanliness, comfort, location, facilities, staff, and value for money while the second part of the form gives users the option to write additional comments. Information received is then rendered anonymous, processed, summarised, and finally presented publicly in the guest reviews section of the page dedicated to the corresponding property.

However, there are certain drawbacks associated with the use of Booking.com as a research material. Mellinas, Martínez María-Dolores, & Bernal García (2015, 2016) point out that this site does not work with a 0-10 or 1-10 scale. Instead, the minimum score for hotels on this webpage is 2.5. This could be associated with "inflated scores", affecting customer perceptions and academic research results.

## Data analysis

### Excel

Prior to commencing the data collection for this study, a template to classify the information was developed on Excel. On the one hand, categories referring to the lodgement were hotel name, star rating, Booking.com rating, number of reviews, segmentation and whether the establishment is part of the preferred property program.

On the other hand, categories attributed to the opinion were reviewer's name, country of origin and number of opinions, as well as review's language, rating, headline and body and whether the hotel replied to the guest's opinion.

Once the Excel sheet had been prepared, the process of data collection started. A general search with the criterions *Palma de Mallorca* as destination, *Monday 4 June 2018* as check-in date, *Tuesday 5 June 2018* as check-out date, *2 adults, no children and 1 room* was carried out to retrieve a list of the properties available. A second search for the dates 3-4 September 2018 was also performed to find out alternative properties. All comments were collected during January and February 2018.

To obtain a range of lodgements that suited the research criteria, the results were then filtered. Thus, parameters of *hotels* and *3, 4 and 5 stars* were selected. When accessing the reviews, it was necessary to screen opinions scored as *very poor* (between 1 and 3 points) or *poor* (between 3 and 5 points) and written in English. Next, the contents of the comments were inserted in the spreadsheet.

It is important to stress that repeated reviews, comments that did not meet Booking.com guidelines, as well as those classified as English opinions but written in other languages or marked as negative but actually positive were removed from the sample under analysis.

### RapidMiner

In the follow-up phase of the study, *RapidMiner* was used to identify patterns in the reviews with the technique of text mining. TIBCO Software Inc (n.d.) states:

> The purpose of text mining is to process unstructured (textual) information, extract meaningful numeric indices from the text, and, thus, make the information contained in the text accessible to the various data mining algorithms. At the simplest level, all words found in the input documents will be indexed and counted in order to compute a table of documents and words, i.e., a matrix of frequencies that enumerates the number of times that each word occurs in each document.

As for the software used, *RapidMiner Studio* is a visual design environment for rapidly building complete predictive analytic workflows (RapidMiner, 2017). According to Poucke et al. (2016):

> One of the important strengths of RapidMiner is its flexibility in process design through "Process/Sub-process" structures and "Macros" that represent global variables of the environment. This enables a visual design of complex processes, and a high level of automation, which is usually possible only by programing (e.g. in R or Python).

As reported by Kim, Park, Yun, & Yun (2017), methods such as word counting or networks analysis can be useful to extract some important keywords; however, it is difficult to show positive or negative mood of the reviews. Hence, in this research positive observations in the body of the reviews were discarded.

Whereas the average number of words collected and analysed in previous studies was very small (around 100–300 words) (Kim et al., 2017), 17,159 words were evaluated in this investigation to obtain a remarkable outcome.

What follows is a description of the data analysis procedures using *RapidMiner Studio* and with the help of a video tutorial (RapidMiner, 2018; Shah, 2016). First, a repository was created, storing a new process in it. Second, the operator *process documents from files* was dragged on the design sheet and then joined with the input, which is a text file containing all the reviews and with the process' results, a data table along with a word list.

Third, the following operators were inserted as a sub-process:
- *Tokenize*: splits the text of a document into a sequence of tokens*.* In this case, each token is formed by a single word.
- *Transform cases*: transforms cases of characters to lower cases.
- *Filter stop words* (English): removes English stop words, i.e. extremely common words that appear to be of little value in this process (a, an, and, are, as…) (Manning, Raghavan, & Schutze, 2008).
- *Generate n-grams* (terms): creates term n-Grams of tokens, i.e. a series of consecutive tokens of length n, in this case with the maximum length of 5 tokens (words).
- *Filter tokens* (by length): filters tokens (words) based on their length. Here, between 3 and 25 characters.

Next, the designed process was executed and the results were screened according to the number of occurrences. Then, the outcome was transcribed on a spreadsheet and last but not least, the following statistics were calculated:

- Average of *Booking.com* rating of the properties analysed.

- Average number of comments written on *Booking.com* by the reviewers analysed.

- Number of filled in reviews.

- Number of blank reviews.

- Number of members of the Booking.com Preferred Program.

- Number of reviews answered by the hotel management team.

- Relative frequency of the most common words in the reviews' body, that is, the total of occurrences of each of those words divided by the total of words.

- Main countries of origin of the reviewers: the technique of *text mining* using *RapidMiner Studio* was used to obtain this statistic as well.

- Relative frequency of the main countries of origin of the reviewers, i.e. total occurrences of each country of origin divided by the total number of reviews.

# Results and discussion

The section below presents the most remarkable results of this research, which can be discussed under three headings: hotel statistics, reviewer statistics and most frequent words in the reviews analysed.
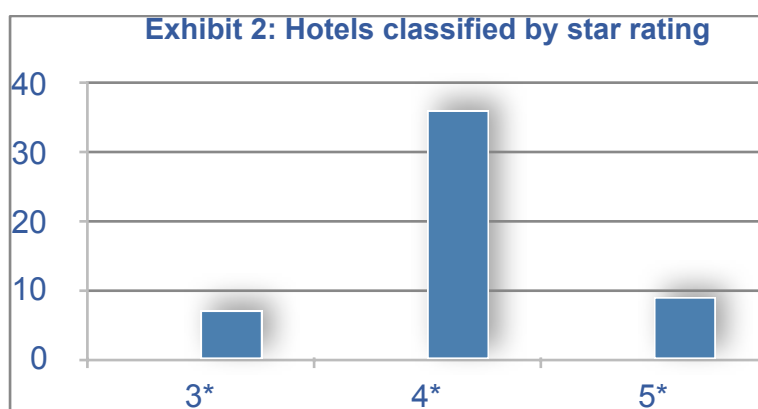
## Hotel statistics

**Exhibit 1** presents the lodgements in which complaints have been collected, including their star rate, their Booking.com rating, the total number of reviews at the time of the data collection and whether they are in the preferred property program of *Booking.com*.

*Exhibit 1: Hotels*

| | Star rating | Booking.com rating | Number of reviews | Preferred property |
|---|---|---|---|---|
| BQ Belvedere Hotel | 3 | 8.0 | 1,846 | No |
| Hotel Araxa - Adults Only | 3 | 8.2 | 992 | No |
| Hotel Blue Bay | 3 | 7.6 | 1,269 | No |
| Hotel Colon | 3 | 7.6 | 1,086 | No |
| Hotel Amic Horizonte | 3 | 7.2 | 2,152 | Yes |
| Hotel de Interior Ca Sa Padrina | 3 | 7.3 | 364 | No |
| Sercotel Hotel Zurbarán | 3 | 8.1 | 367 | Yes |
| Catalonia Majórica | 4 | 8.1 | 3,234 | Yes |
| Boutique Hotel Posada Terra Santa | 4 | 9.5 | 589 | Yes |
| Hotel Almudaina | 4 | 8.8 | 3,764 | Yes |
| Puro Hotel | 4 | 8.6 | 802 | Yes |
| Hotel Mirador | 4 | 7.7 | 1,445 | Yes |
| Tryp Palma Bellver Hotel | 4 | 8.2 | 2,338 | Yes |
| Melia Palas Atenea | 4 | 8.2 | 1,288 | Yes |
| UR Palacio Avenida - Adults Only | 4 | 8.0 | 1,374 | Yes |
| Hotel Costa Azul | 4 | 8.5 | 1,778 | Yes |
| Hotel Armadams | 4 | 7.8 | 959 | Yes |
| Brondo Architect Hotel | 4 | 8.0 | 1,074 | Yes |
| Isla Mallorca & Spa | 4 | 8.2 | 3,325 | Yes |
| HM Jaime III | 4 | 8.3 | 1,947 | Yes |
| Hotel Continental | 4 | 8.5 | 1,327 | Yes |
| Hotel Saratoga | 4 | 8.3 | 2,260 | Yes |
| Hotel Dalt Murada | 4 | 8.1 | 1,227 | Yes |
| UR Mision de San Miguel | 4 | 8.1 | 907 | Yes |
| Nakar Hotel | 4 | 9.3 | 1,113 | No |
| Melia Palma Bay | 4 | 8.6 | 962 | No |
| Be Live Adults Only La Cala Boutique Hotel | 4 | 7.9 | 119 | No |
| Palau Sa Font | 4 | 9.0 | 867 | No |
| Hotel Cort | 4 | 9.5 | 407 | No |
| Hotel Feliz | 4 | 8.6 | 869 | No |
| Hotel Palladium | 4 | 8.3 | 2,057 | No |
| Hotel Be Live Adults Only Marivent | 4 | 8.0 | 1,069 | Yes |
| HM Balanguera | 4 | 8.3 | 1,074 | Yes |
| Eurostars Marivent | 4 | 8.6 | 362 | Yes |
| UR Portofino | 4 | 8.1 | 946 | Yes |
| Hotel Joan Miró Museum | 4 | 7.9 | 1,055 | Yes |
| Innside by Melia Palma Center | 4 | 8.9 | 1,624 | Yes |

| | Star rating | Booking.com rating | Number of reviews | Preferred property |
|---|---|---|---|---|
| Hotel Tres | 4 | 9.2 | 720 | No |
| Hotel Be Live Adults Only Costa Palma | 4 | 7.8 | 322 | No |
| BQ Augusta Hotel | 4 | 8.8 | 1,364 | No |
| Hotel Hostal Cuba | 4 | 8.7 | 179 | Yes |
| AC Hotel Ciutat de Palma, a Marriott Lifestyle Hotel | 4 | 7.9 | 253 | No |
| NH Ciudad de Mallorca | 4 | 7.9 | 522 | No |
| Convent de la Missio | 5 | 9.4 | 524 | Yes |
| GPRO Valparaiso Palace & Spa | 5 | 8.7 | 689 | Yes |
| Sheraton Mallorca Arabella Golf Hotel | 5 | 8.7 | 274 | Yes |
| Gran Melia Victoria | 5 | 8.8 | 672 | Yes |
| Boutique Hotel Sant Jaume | 5 | 9.2 | 117 | Yes |
| Boutique Hotel Can Cera | 5 | 9.2 | 233 | Yes |
| Nixe Palace | 5 | 8.7 | 672 | Yes |
| Sant Francesc Hotel Singular | 5 | 9.4 | 454 | No |
| Palacio Ca Sa Galesa | 5 | 8.9 | 167 | No |

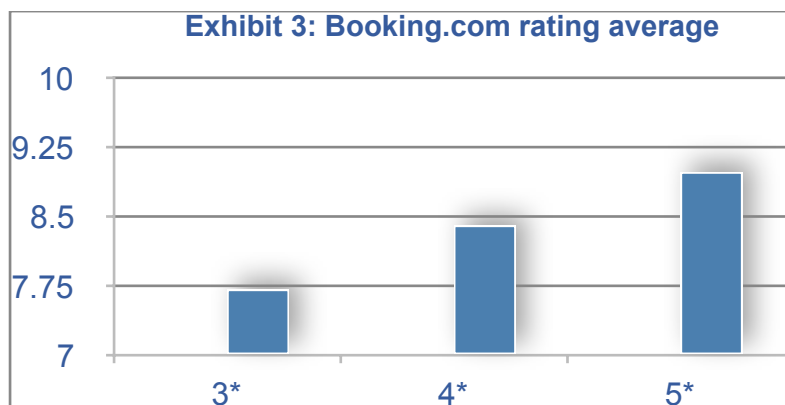**Exhibit 2** displays the breakdown of establishments in the sample studied according to star rating. What stands out in the chart is the prevalence of four-star hotels, also predominant in the *Booking.com* lodgement pool for Palma de Mallorca (Booking.com, n.d.-a).



Exhibit 2: Hotels classified by star rating

This result differs from the official statistics of 2016, which in the case of Palma placed three-star hotels slightly ahead of four-star hotels both by establishments and by number of hotel beds (Institut d'Estadística de les Illes Balears (IBESTAT) a partir de datos del Observatori Turístic de les Illes Balears, 2016).

This has three possible explanations: first, not all hotels in Palma sell their rooms on *Booking.com*. Second, unlike official statistics, this online travel agency does not include peripheral areas of the city in the search (Booking.com, n.d.-a). Third, it may be due to new hotel openings since 2016.

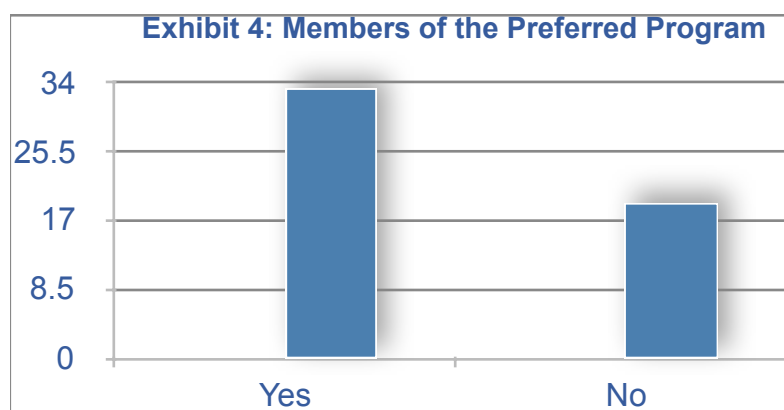As shown in **exhibit 3**, the five-star hotel set presents the highest ranking average on *Booking.com* rating, reinforcing the thesis of Jeong & Mindy Jeon (2008) according to which upscale and luxury hotels perform better than lower rated hotels.

**Exhibit 3: Booking.com rating average**

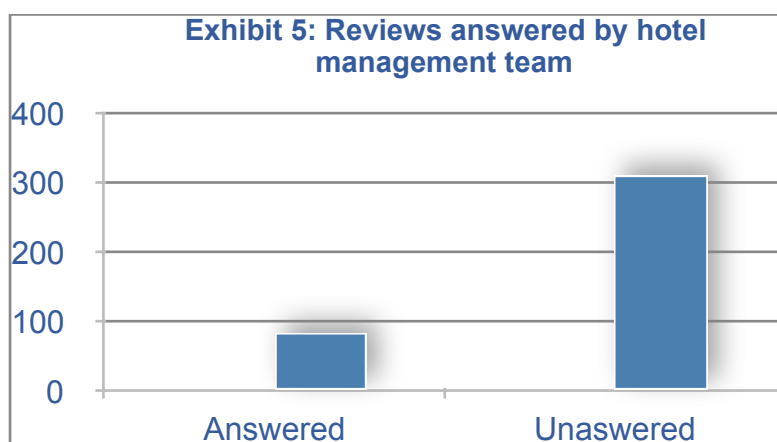Interestingly, 63.46% of the properties (33 hotels) are part of the *Booking.com* preferred program. Two implications can be extracted from this finding: on the one hand, it means that these establishments perform among the 30% properties in their area and, on the other, that they pay a higher commission amount to appear towards the top of the search results, as part of their marketing efforts to position themselves in one of the online travel agencies with a higher market power (**see exhibit 4**) (Booking.com, n.d.-b; eMarketer, 2017).

**Exhibit 4: Members of the Preferred Program**

What is striking about the figures in **exhibit 5** is the low rate of complaints answered by the hotel management: only 20% of them (81 out of 395). This contradicts previous research that advise replying to complaints immediately and authentically to increase positive loyalty behaviours (Barsky & Frame, 2009; Chan & Guillet, 2011; Levy, Duan, & Boo, 2013; Mattila & Mount, 2003; Zheng, Youn, & Kincaid, 2009). In any case, complaints might have been addressed through other channels than Booking.com.

**Exhibit 5: Reviews answered by hotel management team**

## Reviewer statistics

As was mentioned in the previous chapter, British customers are by far the most numerous (45.06%). Spaniards (7.59%) and Germans (5.06%) are in the third and fourth place, followed closely by Americans (4.30%) and Swedes (3.80%). A group consisting of the rest of nationalities of the reviewers ranks second just behind Britons (34.18%) (**see exhibit 6**).



**Exhibit 6: Nationalities**
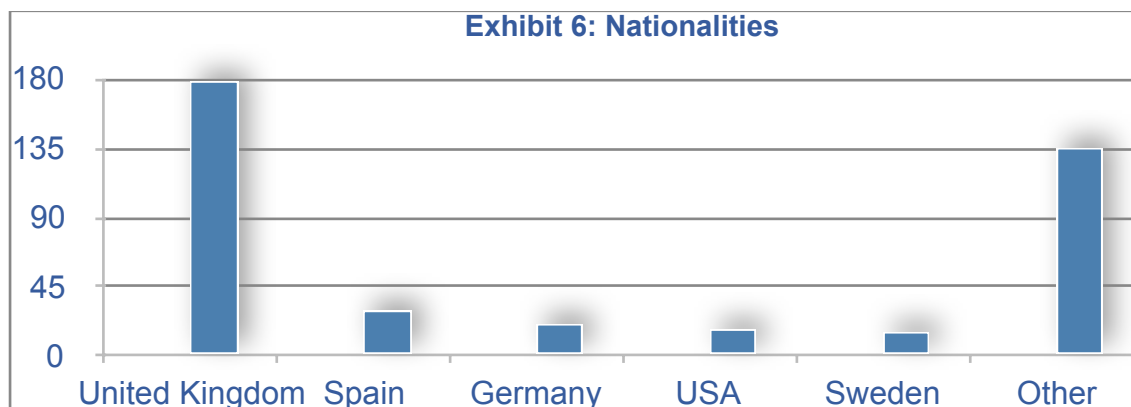
All reviews collected are written in English, even though in countries such as Spain, Germany or Sweden, English is not an official language. Two possible causes may explain this situation, i.e., the fact that most reviews coming from non-English speaking countries are still written in this Germanic language. Firstly, some of these reviews may have been written by English native speakers living in a non-English speaking country such as those mentioned above. Secondly, as English is the international language, some customers may have chosen to write in this language to guarantee greater diffusion of their complaints.

An average of 6.59 reviews were posted by the travellers who wrote the comments analysed, demonstrating that those who travel tend to frequently use travel review sites (Gretzel & Yoo, 2008; Stringam & Gerdes, 2010).

Looking at **exhibit 7**, it is apparent that in the presence of clear incentives, e.g. when an unsatisfactory service has been received, the users of such platforms voice their opinions, as 78.48% of the reviews (310 out of 395) have content in their body (Admati & Pfleiderer, 2001; Hu, Pavlou, & Zhang, 2006; Jurca, Garcin, Talwar, & Faltings, 2010).

This does not mean, however, that travellers leaving the body of the review blank had no interest in reporting the service received; they complained by writing a headline and scoring the six criteria mentioned in the previous section.



**Exhibit 7: Reviewers writing complaints**
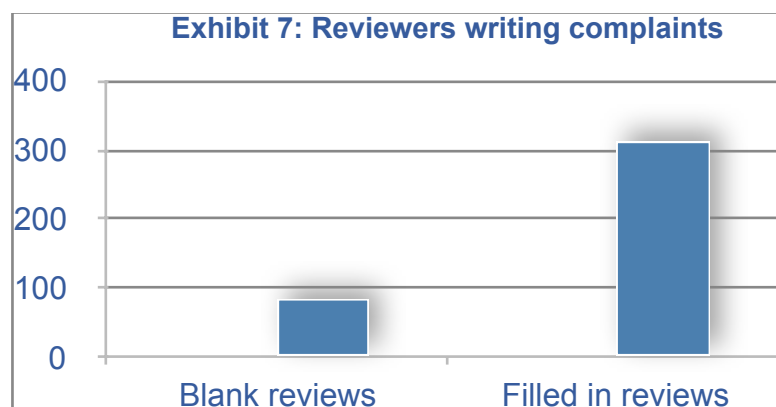
## Most frequent words in reviews

As previously mentioned, in this section we will discuss the most common words appearing in the body of the complaints.

*Exhibit 8: Most frequent words*

| Word | Count | Rank | Frequency | Total |
|------|-------|------|-----------|-------|
| Room | 270 | 1 | 1.57% | 17,159 |
| Hotel | 203 | 2 | 1.18% | |
| Staff | 113 | 3 | 0.66% | |
| Rooms | 65 | 4 | 0.38% | |
| Service | 56 | 5 | 0.33% | |
| Poor | 55 | 6 | 0.32% | |
| Bed | 54 | 7 | 0.31% | |
| Night | 54 | 8 | 0.31% | |
| Get | 51 | 9 | 0.30% | |
| Reception | 51 | 10 | 0.30% | |
| Pool | 50 | 11 | 0.29% | |
| Breakfast | 48 | 12 | 0.28% | |
| Day | 46 | 13 | 0.27% | |
| Bad | 44 | 14 | 0.26% | |
| Old | 37 | 15 | 0.22% | |
| Asked | 36 | 16 | 0.21% | |
| Stay | 36 | 17 | 0.21% | |
| Bathroom | 34 | 18 | 0.20% | |
| Floor | 34 | 19 | 0.20% | |
| Beds | 33 | 20 | 0.19% | |
| Area | 30 | 21 | 0.17% | |
| Pay | 30 | 22 | 0.17% | |
| People | 30 | 23 | 0.17% | |
| Shower | 30 | 24 | 0.17% | |
| Star | 30 | 25 | 0.17% | |
| Air | 29 | 26 | 0.17% | |
| Dirty | 29 | 27 | 0.17% | |
| Work | 28 | 28 | 0.16% | |
| Booking | 26 | 29 | 0.15% | |
| Facilities | 26 | 30 | 0.15% | |
| Said | 26 | 31 | 0.15% | |
| Clean | 25 | 32 | 0.15% | |
| Food | 25 | 33 | 0.15% | |
| Good | 25 | 34 | 0.15% | |
| Place | 25 | 35 | 0.15% | |
| Told | 25 | 36 | 0.15% | |
| Location | 24 | 37 | 0.14% | |
| Time | 24 | 38 | 0.14% | |
| Water | 24 | 39 | 0.14% | |
| Wifi | 24 | 40 | 0.14% | |
| Check | 23 | 41 | 0.13% | |
| Double | 22 | 42 | 0.13% | |
| Price | 22 | 43 | 0.13% | |
| Took | 21 | 44 | 0.12% | |
| Coffee | 20 | 45 | 0.12% | |
| Com | 20 | 46 | 0.12% | |
| Noise | 20 | 47 | 0.12% | |
| Noisy | 20 | 48 | 0.12% | |
| Paid | 20 | 49 | 0.12% | |
| View | 20 | 50 | 0.12% | |

To begin with, the nouns *room*, *hotel* and *staff* are, in this order, the most frequent; more specifically, they appeared 270, 203 and 113 times, respectively. This can be likely attributed to the fact that these are words that cover different areas of a hotel, as can be seen in the article by Levy et al. (2013, reviewing previous studies of Lee & Hu, 2004, and Manickas & Shea, 1997) (**exhibit 8**).

Following this criterion, some of the most frequent words may be included in one of these categories:

- Room: *bed* and *beds*, *bathroom*, *shower* and *view*.

- Hotel: *reception*, *pool*, *breakfast*, *area*, *star*, *facilities*, *food*, *location*, *wifi*, and *coffee*.

- Staff: *service*.

Other words cannot be classified in one of these three categories at a glance and hence need a more detailed analysis:

To begin with, the following adjectives, which give more information about the noun they accompany: *poor*, *bad*, *old*, *dirty* and *noisy*. Although only complaints are being analysed, *clean* and *good*, that are positive adjectives, appear on the list, but are typically accompanied by the adverb *not*, e.g. "not very clean", "not good", indicating an unsatisfactory service. *Double*, a neutral adjective, was found to refer to several nouns like *bed*, *checked*, *room* or *paid*, among others.

With regard to verbs, *get*, *asked*, *said*, *told*, *took* and *paid* appear in the ranking; they often allude to communication between the staff and guests and the service received. Some examples include: "the worst staff at the reception […] no customer should **get** such service", "staff requested as much again as I had **paid** Booking.com", "he **asked** our room number and he **said** he will find out what is wrong and will tell us".

*Stay*, *work*, *check* and *pay* can function both as nouns and as verbs. Using *stay* as an example: "our **stay** was totally ruined because we had fifty euros stolen from our room" and "I would never choose **to stay** at this hotel again".

Given the importance of time nowadays, with individuals choosing optimal number of working hours to both finance their consumption needs and have enough time to enjoy consumption (Goembski & Niezgo, 2012), the nouns *night*, *day* and *time* are also relevant. "Waste of **time**" and "check-in took a long **time**" are some examples. Complaints such as "too much noise during the **night**" and "people banging on the door all **night**" prove the importance customers give resting time when travelling.

*Booking* and *com,* with 26 and 20 occurrences respectively, are two of the words of the ranking that surprisingly, most of the times appear together. This is because, when reviewers write about *Booking.com*, in the complaint it frequently comes up as "booking com", and therefore the data mining algorithm detects it as two different words.

In the same vein, *air conditioning* in the rooms is essential and therefore usually generates complaints, as can be extracted from the results where *air*, followed by *conditioning* can be frequently found.

*Water* (which appears on 24 occasions) is one of the nouns appearing in the ranking that has most different connotations: *complimentary bottle of water in the room*, *water in the shower*, *watering the flowers*, *water of the beach* or *watery coffee*, among others. This reveals the role of water not only in different areas of the hotel but in the destination as a whole.

Similarly, *place* (which appears 25 times) has different meanings in the reviews analysed, and may be referred to: the establishment as a whole, e.g. "wouldn't recommend to nobody this **place**", any of the areas of the hotel, e.g. "our room was on the 9th floor and had ants crawling all over the **place**" or a lack of space, e.g. "tiny bathroom with no **place** for even a toothbrush", among others.

In the complaints considered, *floor* (which comes up 34 times) has two main meanings: all the rooms or areas on the same level of a building, e.g., "tiny room on top **floor**" and the lower surface of a room, e.g., "the **floor** covering needs replacing" (Oxford Dictionaries, n.d.-a).

As an industry characterized by invisible exports, location-boundness, intangible service and labour intensiveness, the focus of hospitality is on people (Yu, Yu, & Chon, 1999). Thus, the term *people* has various interpretations in the reviews. First, it may refer to customer typology, e.g. "not a hotel suitable for **people** with disabilities". Second, the term can also make reference to other guests staying at the property, e.g. "at night you can hear **people** talking in the corridor". Third, it may relate to people in the destination, e.g. "the undesirable **people** who were not staying in hotel but constantly around door entrance". Last, it has to do with speaking in the third person about oneself, e.g. "very small room for three **people** sharing".

Defined as something that is well worth the money spent on it (Oxford Dictionaries, n.d.-b), *value for money* is considered when rating a lodgement. Hence, *price* appears 22 times in the reviews. Comments such as "it is not up to the standards expected for the **price**" and "for the **price**, it's the worst hotel I have ever been in" illustrate this point clearly.

# Conclusions

The purpose of the current study was to determine the key drivers of hotel complaints in the lodging market of Palma de Mallorca. To that end, the *text mining technique* was used to retrieve the most common words that appeared in the reviews written by different customers.

The insights gained from this study may be of assistance for hoteliers in order to focus their management strategy on *customer satisfaction*, which is a business philosophy that highlights the importance of creating value for customers, anticipating and managing their expectations, and demonstrating the ability and responsibility to satisfy their needs (Dominici & Guzzo, 2010; Radojevic, Stanisic, & Stanic, 2015).

Although more than half of the properties analysed enhanced their marketing efforts to face competition by joining the preferred program of *Booking.com*, hotel management teams replied only one fifth of the reviews studied. Hoteliers may increase loyalty behaviours and mitigate the impact of online word-of-mouth complaints responding immediately and authentically to each complaint (Barsky & Frame, 2009; Chan & Guillet, 2011; Levy, Duan, & Boo, 2013; Mattila & Mount, 2003; Stringam & Gerdes, 2010; Zheng, Youn, & Kincaid, 2009).

The reviewers of the sample studied seem to be frequent travellers, since they have written an average of more than six comments on *Booking.com*. Thus, having stayed in several establishments, they might be sensitive to price and their initial expectations are most likely to be quite high. Hotel managers should prioritise, on the one hand, *revenue management*, and on the other, *quality management*. (Parasuraman, Zeithaml, & Berry, 1985).

Some reviews refer to *Booking.com* as it is also involved in the service delivery. Hence, hoteliers should work with this online travel agency to address issues involving both organisations.

The results of this BA dissertation show a number of priority areas for improvement in the hotels of Palma de Mallorca:

- *Rooms*: the beds, which are the heart of the room and of the stay; the air conditioning system, which is essential in a warm and humid climate like that of the Balearics; the bathroom and, more specifically, the shower. The views are hard to change once the establishment has been built, albeit the way the rooms are marketed may be improved to minimise complaints.

- *Hotel*: the reception, which is the first contact with the hotel staff and where check-in and check-out speed is essential; the amenities, mainly the pool and Wi-Fi, and in the food and beverage area the focus should be on the food, the coffee and the breakfast, which is a meal that almost all customers eat.

- *Staff*: the communication between staff and guests, which might be enhanced through personnel training.

Moreover, some facilities seem to be old, dirty or noisy and therefore, the hotel management team should place the emphasis on regular renovation of the facilities.

This study highlights the usefulness of the information technologies: (1) *ReviewPro* can enhance the monitoring of hotel guests' reviews; (2) *data mining technology* can be helpful to analyse not only the contents of the reviews but different features of the reviewers; and (3) *blockchain technology* would reduce costs of acquisition and allow greater control over the distribution process, besides improving the trustworthiness of the reviews about hotels (Hospitalitynet, 2017; Levy et al., 2013; Loum, 2018; Radojevic et al., 2015; Zheng et al., 2009).

The findings in this report are subject to at least four limitations:

- Firstly, analysing words isolated from the rest of the text of the complaint may have resulted in a misinterpretation of their meaning.

- Secondly, the *data mining algorithm* did not detect misspelled words in the complaints and therefore these were counted as different words and the ranking may be biased.

- Thirdly, blank reviews were counted in the statistics referring to hotels and reviewers, although their headlines were not taken into account for the ranking of the most frequent words.

- Lastly, it seems clear that the verbs *get*, *asked*, *said*, *told*, *took* and *paid* have proven a miscommunication between staff and guests, but it is not known what specific aspects of the staff should be improved.

It is therefore recommended that further research be undertaken in the following areas:

To begin with, in order to increase the number and the variety of reviews to be analysed, future studies could include complaints coming from other online travel agencies and review sites such as *TripAdvisor* or *Expedia*.

In addition, different *data mining models* may be designed to discern between the positive and negative sentiment of the reviews or to link comments to the reviewers' geographic, demographic, socioeconomic and cultural features.

Last, the geographic approach may be changed to include peripheral areas of Palma de Mallorca, or even Mallorca or the Balearic Islands as a whole. Alternatively, different tourist areas of our region might be compared one to another.

All in all, then, the results obtained in this study indicate that even four and five-star hotels in Palma de Mallorca have some defects subject of approval. Taking into consideration customer's opinions is fundamental since it is the best way to improve and satisfy the customers.

As aforementioned, Palma de Mallorca receives thousands of tourists in the summer season; consequently, we would like to end this project by stating that it is of extreme importance for hotels in Palma to satisfy their guests as much as possible. Only if the customers are happy enough, will they recommend the hotel to other people and possibly return themselves in the future.

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