

ANDERSON SANTOS DE OLIVEIRA

ONLINE REVIEWS: A PATHWAY TO HOTELS IMPROVEMENT



UNIVERSIDADE DO ALGARVE

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ONLINE REVIEWS: A PATHWAY TO HOTELS IMPROVEMENT

Mestrado em Turismo

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Trabalho efetuado sob a orientação da Professora Doutora Ana Isabel

Renda e da Professora Doutora Marisol de Brito Correia



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2020

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*To my parents, who have showed me
that it is possible to change the world
through tenderness, love and
education.*

Thank you, God, for providing the light, the strength and the positivity that lies within me. Thanks mom, for your unconditional love. Thank you, Ana Isabel Renda and Marisol Correia, for your guidance and for making this possible. Thank you, Piera Beatriz, for your companion and support during this journey.

Resumo

Objetivos: O propósito deste estudo é verificar como avaliações sobre hotéis postadas em plataformas de avaliação online podem ser uma ferramenta útil para melhorar o desempenho das empresas hoteleiras. Tal finalidade originou as seguintes questões: 1) De que forma a análise das avaliações online podem ser úteis para os gestores, profissionais de marketing, especialistas e técnicos da indústria hoteleira? 2) Como as avaliações online são normalmente coletadas, filtradas e analisadas por académicos e pesquisadores? A fim de alcançar este objetivo e responder às questões de pesquisa, este estudo é conduzido em duas etapas. Primeiramente é realizada uma revisão sistemática da literatura com vista a identificar uma ampla variedade de contribuições, obtidas através das opiniões de usuários e capazes de auxiliar a decisão de gestores de unidades hoteleiras, independentemente de sua categoria, localização ou tamanho. Uma vez identificados os procedimentos mais relevantes na extração e análise de grandes quantidades de dados, dá-se início a uma nova etapa. O segundo estágio deste estudo consiste em verificar como diferentes mercados Europeus avaliam uma amostra de hotéis Portugueses localizados no Algarve, através da análise de avaliações textuais realizadas na internet. Tal estudo se deve à popularidade e importância da região como destino turístico Europeu. Ao fazê-lo, pretende-se identificar se existem semelhanças entre os fatores de satisfação e insatisfação apresentados por turistas residentes do Reino Unido, França e Portugal, que pernoitam na região.

Metodologia: Um primeiro estudo de revisão sistemática da literatura baseado em investigações anteriores, tais como as de Kizildag, Altin, Ozdemir, and Demirer (2017) e de Le, Scott and Lohmann (2019) é conduzido, com o objetivo de identificar publicações científicas que exploram o uso de avaliações online como um instrumento para a indústria hoteleira e prover percepções significativas para profissionais da indústria hoteleira. Para tanto, são analisadas revistas com arbitragem científica em língua inglesa, espanhola e portuguesa, publicadas mundialmente entre janeiro de 2008 e janeiro de 2020, contendo as palavras-chave: avaliações online, melhoria dos hotéis, desempenho hoteleiro e desenvolvimento de hotéis, em onze diferentes bases de dados. O processo de revisão sistemática de literatura é então dividido em cinco estágios. Primeiramente são definidas

as perguntas de pesquisa. De seguida, é formulado o protocolo de revisão. Posteriormente, dá-se início a condução da pesquisa de literatura, onde os documentos passam por um extenso processo de seleção e análise. O quarto estágio consiste na coleta de informações-chave de cada um dos artigos selecionados e, finalmente, no último estágio, é realizada a análise do conteúdo, assim como a apresentação dos resultados, discussão e conclusão. A partir dos resultados obtidos através da revisão sistemática de literatura, um estudo de caso envolvendo segmentação de mercado, análise de frequência e análise de sentimento é conduzido. Por sua vez, a segunda etapa deste trabalho analisa as avaliações online referentes às unidades hoteleiras de 1 a 5 estrelas localizadas no Algarve, registadas no Registo Nacional dos Empreendimentos Turísticos (RNET), e com dados elegíveis para extração junto a uma das mais populares plataformas de avaliações online de produtos turísticos da atualidade, o site TripAdvisor.com. Foram selecionadas avaliações textuais em língua inglesa, francesa e portuguesa, redigidas por turistas residentes do Reino Unido, França e Portugal no período compreendido entre janeiro e dezembro de 2019. Após sua extração, os dados passam por um processo de refinamento onde são segmentados de acordo com o idioma e país de residência, além de serem revisadas ortograficamente para minimização de vieses durante sua análise. Após refinados, os dados extraídos são submetidos a análises de frequência e de sentimento por meio de um software apropriado. Os resultados obtidos são então expostos, discutidos e novas implicações académicas e práticas são apresentadas.

Resultados: Após a condução do primeiro estudo, o referente à revisão sistemática de literatura, 59 artigos considerados relevantes para obtenção de respostas aos questionamentos propostos por este estudo foram identificados e analisados em sua totalidade. Tal verificação resultou na revelação de diversas abordagens capazes de demonstrar como as avaliações online apoiam o desenvolvimento e aperfeiçoamento de negócios no sector hoteleiro. Os resultados obtidos demonstram que os comentários extraídos das plataformas de avaliação online mais populares submetidos a técnicas de mineração de dados e metodologias tais como análise de sentimento, agrupamento de dados e análise de regressão, têm permitido que académicos e pesquisadores compreendam quais atributos tangíveis e intangíveis influenciam a satisfação dos hóspedes de um modo geral, além de segmentar mercados, identificar tendências de mercado, bem como oportunidades e mudança de comportamento dos consumidores.

Embora um número significativo de implicações práticas tenha sido revelado, lacunas de investigação são identificadas e recomendações para futuros estudos são fornecidas. o segundo estudo conduzido com base na análise de frequência, bem como na análise de sentimento de 8.596 avaliações online, extraídas do site TripAdvisor, sobre 161 unidades hoteleiras localizadas na região do Algarve, em Portugal permitiu demonstrar que, não somente as taxas de satisfação e insatisfação com relação aos atributos dos hotéis diferem de acordo com cada mercado, mas também que turistas de diferentes origens geográficas e contextos culturais, enfatizam esses atributos distintivamente. Ademais, tais revelações sugerem o uso de análises e técnicas de mineração de dados como uma importante ferramenta para compreender a percepção dos hóspedes com relação aos atributos dos hotéis. Desta forma, gestores podem investir seu orçamento de forma mais precisa com vistas à melhoria dos serviços e produtos oferecidos aos seus clientes.

Implicações da investigação: Para além de contribuir para a literatura existente, aumentando a pesquisa atual sobre o uso de avaliações online e técnicas de mineração de dados, os resultados deste estudo também fornecem aos profissionais da indústria hoteleira informações sobre como tirar proveito destas avaliações, além de identificar oportunidades de melhoria com base na análise de avaliações textuais de três mercados Europeus distintos numa mesma plataforma. As diversas formas apresentadas por este estudo sobre como as avaliações online podem ser analisadas, proporcionam aos gestores e profissionais do setor hoteleiro ideias de como é possível obter resultados precisos e atempados sobre a percepção de seus hóspedes. Além disso, algumas dessas aplicações podem ser menos dispendiosas quando comparadas com abordagens mais tradicionais, como por exemplo, a aplicação de questionários de satisfação junto aos clientes.

Originalidade: Embora vários estudos se centrem no desenvolvimento de negócios dos hotéis usando avaliações online, apenas alguns estudos reuniram esses documentos para verificar as suas aplicações e implicações ao nível da gestão. Outrossim, ainda que um número significativo de artigos sobre segmentação de marketing através de técnicas de mineração de dados tenha sido publicado, este estudo analisa a satisfação geral de hóspedes pertencentes a três relevantes mercados Europeus para o Algarve e sugere implicações práticas atualizadas para académicos e profissionais do setor hoteleiro. Desta forma, este trabalho vem preencher essas lacunas de pesquisa.

Palavras-chave: avaliações online, análise de sentimento, gestão hoteleira, mineração de dados, TripAdvisor, revisão sistemática.

Abstract

Purpose: The purpose of this study is to verify how online reviews can become a useful tool to improve the performance of hotel businesses. Therefore, this study is performed in two stages. Firstly, a systematic literature review is conducted to identify a variety of general contributions that the analysis of online reviews can bring to hoteliers. Posteriorly, through the analysis of online reviews, this study verifies how distinct European markets evaluate a sample of hotels located in the Algarve and checks if satisfaction and dissatisfaction towards hotel attributes are similar among them.

Methodology: Two different methodologies are approached during this work. First, the systematic literature review analyses refereed journals containing the keywords: online reviews, hotel improvement, hotel performance and hotel development, published between January 2008 and January 2020. Afterwards, this study analyses online reviews of hotel units located in the Algarve, written in English, French as well as Portuguese languages and posted on TripAdvisor by British, French and Portuguese residents from January 2019 to December 2019.

Findings: After examining 59 relevant papers, a range of approaches on how online reviews support hotel business development are uncovered. Furthermore, the analysis of 8,596 online reviews evidences that satisfaction and dissatisfaction rates towards hotel attributes differ according to the geographic distance and cultural background. Besides contributing to the existing literature by extending the current research on the use of online reviews, results obtained from both stages provide hoteliers with insights to make better use of online reviews.

Originality: Although several studies approach hotel business development using online reviews, only a few studies have gathered these papers to verify their managerial implications. Additionally, this paper analyses customer satisfaction of relevant tourist markets and suggests up-to-date practical implications for hoteliers, apart from contributing to extending the research on this field.

Keywords: online reviews, sentiment analysis, hotel management, data mining, TripAdvisor, systematic review.

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1. Introduction

The tourism industry has faced ten years of sustained development, technological advances and remarkable profits in a global scale between 2010 and 2019. International overnight visitors increased 4% globally in 2019, reaching nearly 1.5 billion arrivals during that year and the growth of international tourist arrivals continued to surpass the global economy (World Tourism Organization, 2020a). Be that as it may, the COVID-19 pandemic caused an unexpected sanitary and economic global crisis forcing business to shut down, border closures between countries, mandatory quarantine periods and lockdowns. From January 2020 to May 2020, a drop of 56% of international tourist arrivals in comparison with 2019 has been registered and the total impact of this global issue on the world economy is not known yet (World Tourism Organization, 2020b).

Still, Portugal has built a remarkable reputation as a tourist destination, being considered for the fourth consecutive year as the best destination in Europe (Turismo de Portugal, 2020). Also, during 2010 and 2019, the number of hotels in Portugal almost duplicated. In 2010 Portugal had 771 hotels registered. In 2019, the number of this type of accommodation raised to 1.449 (PORDATA, 2020). Additionally, the country observed a growth of 7.9% in non-resident tourist arrivals and a 4.3% increase on overnight stays compared to the previous year. 24.6 million non-resident arrivals and 77.8 overnight stays, respectively (Instituto Nacional de Estatística, 2020). Although these are very attractive numbers to hoteliers and other accommodation businesses, this is a very competitive market, hence it becomes indispensable to stand out from players and surpass customers' expectations and needs.

Throughout the years, online reviews are proven to be a reliable source of information among travellers seeking for hotel rooms around the world, given that these comments comprehend non-commercial, authentic, experiential and comprehensive information about tourist products (Ait-Bakrim, Attouch, Guerreiro & Perez-Aranda, 2019). Countless online reviews are willingly posted by the minute by tourists who want to share their experience with others. This innumerable amount of data can not only help customers to better select their next accommodation but can also assist hoteliers to make better and more accurate management decisions, which lead us to the following

questions: 1) What kind of contributions can the analysis of online reviews bring to hotel managers and marketers? 2) How are they commonly obtained, filtered and analysed by scholars and researchers? 3) Do satisfaction and dissatisfaction attributes change significantly among Portugal's main foreign tourist markets and the domestic market?

With the purpose of answering the aforementioned questions, this work has been divided into two stages, represented by the execution and submission of two scientific papers to referred academic journals. First, a systematic literature review was conducted so as to verify how online reviews can become a useful tool for the improvement of hotel businesses through an in-depth analysis of selected scientific papers. This step was strictly necessary in order to comprehend how the whole process is conducted and what insights can be obtained from such work. The first paper has been titled *Online reviews: a pathway to improve hotel management* and it was submitted to the Dos Algarves: A Multidisciplinary e-Journal on March 24, 2020. The paper was accepted on May 8, 2020 and published on its 36th special issue on May 2020. Also, the work has been accepted and included on the XI Postgraduate Conference on Management, Hospitality and Tourism program held on October 2, 2020 and submitted to the t-Forum 2020 conference to be held from November 4 to November 7. All documentary evidence, such as submission and acceptance registers as well as Conference Program, was included in the appendixes A, B, C, D, E, F and J. Dos Algarves: A multidisciplinary e-Journal's author guidelines can be found in Annexe 1.

As the second stage of this work, this study analyses a sample of online reviews to verify how different European markets evaluate a range of Portuguese hotel units located in the Algarve. By using techniques uncovered by the first paper, the authors intend to observe if satisfaction and dissatisfaction towards hotel attributes are similar among them. The second paper is called *Hotel customer segmentation and sentiment analysis through online reviews: an analysis of selected European markets* and it was submitted to the academic journal Tourism and Hospitality Research (THR) on September 24, under the ID THR-20-0234. The manuscript is currently under the consideration of the journal's reviewers. Furthermore, the work has been accepted for an oral presentation, by the Scientific Committee of the XII International Tourism Congress, to be held from 27 to 28 October 2020. All supporting documents from both academic journal and conference are available in the appendixes G, H and I. THR's guidelines were included in Annexe 2.

Finally, this study is presented as follows. First, the systematic literature review entitled *Online reviews: a pathway to improve hotel management* is presented in its original layout and ordering, as required by the multidisciplinary e-journal. Next, the article *Hotel customer segmentation and sentiment analysis through online reviews: an analysis of selected European markets* is also submitted as the second stage of this research. It is also presented in the journal's required formatting style and layout. Then, a general discussion and conclusion are provided along with research limitations and recommendations for future studies.

2. Article I: Online reviews: A pathway to improve hotel management

Online reviews: a pathway to improve hotel management

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Abstract

The purpose of this study is to verify how online reviews can become a useful tool for the improvement of hotel businesses through an in-depth analysis of selected scientific papers. This systematic literature review analyses refereed journals in English, Spanish and Portuguese, published worldwide between January 2008 and January 2020 and containing the keywords: online reviews, hotel improvement, hotel performance and hotel development, in 11 different databases.

After examining 59 relevant papers, a range of approaches showing how online reviews support hotel business development are uncovered. Besides contributing to the existing literature by extending the current research on the use of online reviews, the findings of this study also provide hoteliers with insights on how to take advantage of online reviews. Although several studies approach hotel business development using online reviews, only a few studies have gathered these papers to verify their applications and managerial implications. Thus, this paper fills this research gap.

Keywords: online reviews, hotel performance, hotel management, systematic review.

1 Introduction

User generated content (UGC) refers to the way internet users exchange information through platforms such as social media. UGC comprises online reviews, which are recommendations and opinions shared by customers on social media, review or booking websites and electronic word-of-mouth (e-WOM), which refers to online positive or negative opinions about any product or service someone has experienced (Anagnostopoulou, Buhalis, Kountouri, Manousakis, & Tsekrekos, 2019; Ait-Bakrim, Attouch, Guerreiro, & Perez-Aranda, 2019; Phillips, Barnes, Zigan, & Schegg, 2017). UGC has dramatically changed consumer behaviour, especially in the hospitality industry (Phillips, Zigan, Silva, & Schegg, 2015). Besides influencing decision making during the purchase process of hospitality products and services, the introduction and use of online review systems are a recent example of disruptive innovation in the hospitality industry (Lui, Bartosiak, Piccoli, & Sadhya, 2018).

Since the first online hotel review for Captain's House Inn on TripAdvisor in 2001, a lot has changed. E-WOM has become a reliable source of information for tourists and travellers that are willing to book an accommodation anywhere in the world, since they comprehend non-commercial, authentic, experiential and detailed information about tourist products (Ait-Bakrim et al., 2019). Thousands of online reviews are voluntarily posted every second by people who have experienced all kinds of tourist services.

Throughout the years, research regarding online reviews has significantly increased in the major tourist markets, which shows the growing interest of researchers and practitioners in the subject. However, despite the vast body of literature concerning the utility of online reviews and e-WOM from a customer perspective, not as many studies on how hoteliers can benefit from data mining to improve business performance have emerged. Since recent studies prove the potential of UGC to assist hoteliers, more resources are recommended to be employed in research on online reviews (Antonio, de Almeida, Nunes, Batista, & Ribeiro, 2018). Therefore, this systematic literature review aims to uncover a variety of general contributions that the analysis of online reviews can bring to hoteliers, regardless of their category, location or size. Furthermore, this study not only intends to explore some managerial applications, but also aspires to identify the main stages of data mining research techniques and present a general framework that helps to synthesize the most recurring methodologies. By doing so, this review expects to present a comprehensive overview of data mining studies regarding the hotel industry.

By analysing a selection of peer-reviewed scientific articles, this systematic review contributes to the existing literature and to practitioners by presenting a variety of applications of online reviews

and managerial implications to assist hoteliers in improving their business. Results are expected to provide a relevant contribution to knowledge development, besides helping hotel managers and researchers to understand how to take advantage of online reviews from a business perspective.

The study is divided into 5 main sessions, as follows. In the next session, the methodology for the selection of papers is fully explained. Next, an overall view of the selected articles is provided. After that, the results are discussed, and then a final conclusion is presented along with research limitations and recommendations for future studies.

2 Methodology

Based on previous studies, such as Kizildag, Altin, Ozdemir, and Demirer (2017) and Le, Scott and Lohmann (2019), a systematic literature review is conducted and divided into five stages to explore how the analysis of online reviews can lead to performance improvement in the hotel industry. First, the research questions were defined. Second, the review protocol was formulated. Third, literature research was conducted. Next, relevant literature was selected. Finally, the findings were synthesized, presented and discussed (Figure 1).

The main objective of this study is to verify how online reviews can lead hotels to the improvement and development of their business. This goal led the authors to the following questions: 1) What kind of contributions can the analysis of online reviews bring to hotel managers and marketers? 2) How are they commonly obtained, filtered and analysed by scholars and researchers?

After the definition of the main objective and research questions, the review protocol was created. The following keywords were defined: online reviews, hotel improvement, hotel performance and hotel development. Since the last three terms have similar definitions regarding the positive results for hotel businesses, all of them were included in the review protocol.

Next, a literature search containing the aforementioned words in the abstract was conducted through the following 11 databases (presented in alphabetical order): (1) Academic Search Complete; (2) Business Source Complete; (3) Complementary Index; (4) Directory of Open Access Journals; (5) IEEE Xplore Digital Library; (6) Library, Information Science and Technology Abstracts; (7) Procedia Computer Science; (8) Scielo; (9) ScienceDirect; (10) Scopus; and (11) Supplemental Index. The review covered the period from January 2008 until January 2020 as the volume of online guests' evaluation for hotels started to become popular from 2006 (Duan, Yu, Cao, & Levy, 2016). Only peer-reviewed scientific papers were included in the search to ensure the quality of the review. Three options of languages were included in the search: English, Spanish and Portuguese.

As shown in Figure 1, a three-filter process was applied during the search process. In January 2020, a total of 398 articles were presented. After duplicate records were excluded, the total amount of publications that meet the search criteria decreased to 123. Then, an abstract screening process justified the exclusion of 54 articles for the following main reasons: not part of the scope of this review or unable to answer the research questions, duplicated material not previously detected. Furthermore, any remaining Internet publication, news, conference material, books or book chapters were excluded. Following this procedure, 69 remained for full-text assessment. Following this procedure, 69 remained for full-text assessment.

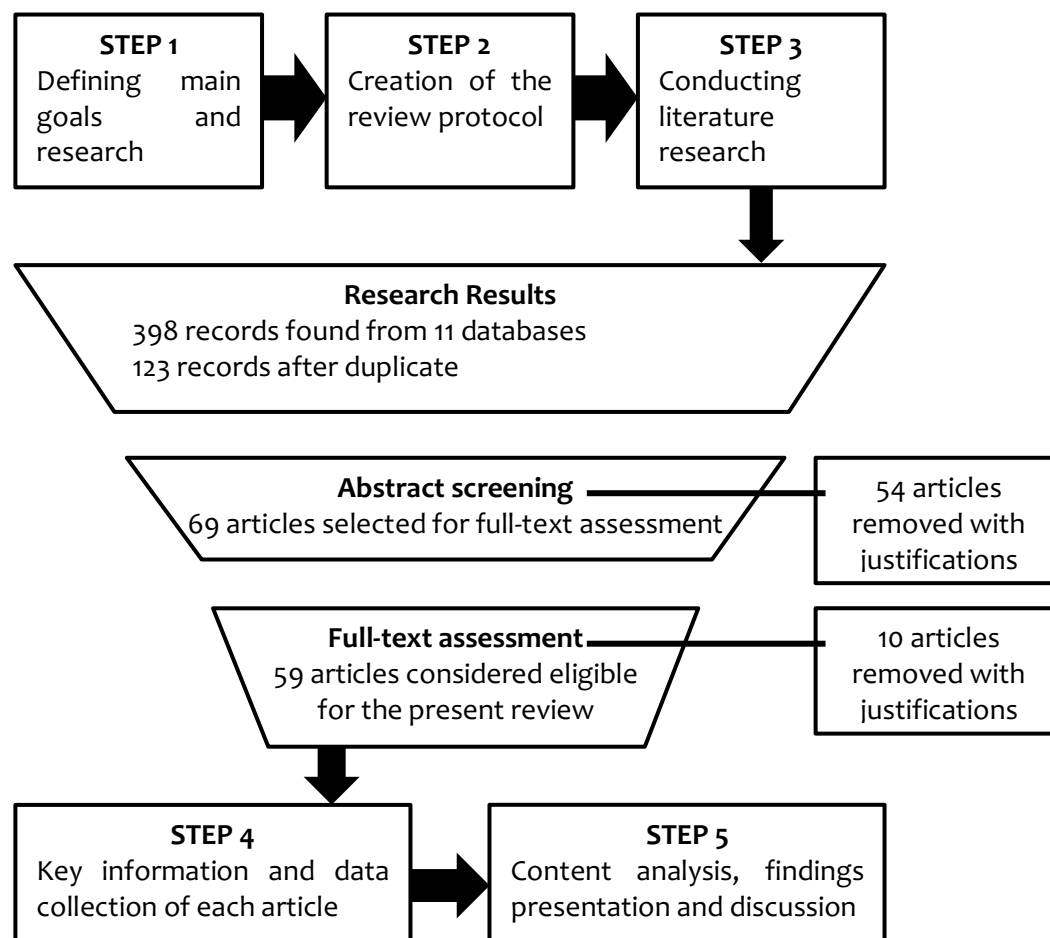


Figure 1. Systematic literature review process (Adapted from Le et al., 2019)

During the full-text assessment procedure, 10 articles were excluded for the following reasons: Neither collected or analysed online reviews, nor provided hoteliers with practical implications (Ait-Bakrim et al., 2019; Kamboj & Rahman, 2017; Kim, Kim, & Park, 2017; Nizamuddin, 2015; Păunescu & Moraru, 2018; Tsaur, Huang, & Luoh, 2014). The main focus of the study is to validate or develop an online review related system or algorithm (Xiang, Du, Ma, & Fan, 2018), while the focus of the study and managerial implications were related to another type of accommodation (Xu, 2020) and studies were identified as review papers (Baker, Eziz, & Harrington, 2019; Kizildag

et al., 2017). Finally, 59 articles were considered for this study. Next, all 59 articles had their key information, such as authors, year, journal, title, online platform approached by the study, hotel locations, purpose and managerial implications, were classified and inserted into an Excel spreadsheet. Finally, the findings were presented and discussed.

3 Results

3.1 Overall view of selected papers

Among the articles considered for the purpose of this study, three journals stand out as representing more than one third of the publications (Table 1). The International Journal of Hospitality Management, Tourism Management and the International Journal of Contemporary Hospitality Management ranked in 4th, 2nd and 6th positions, respectively, in the Tourism, Leisure and Hospitality Management category of Scimago Journal and Country Rank in 2018.

Journal name	No of articles	%
International Journal of Hospitality Management	9	15%
Tourism Management	8	14%
International Journal of Contemporary Hospitality Management	4	7%
Asia Pacific Journal of Tourism Research	2	3%
Cornell Hospitality Quarterly	2	3%
International Journal of information management	2	3%
Journal of Electronic Commerce Research	2	3%
Journal of Hospitality and Tourism Research	2	3%
Procedia Computer Science	2	3%
Others	26	44%

Table 1. Articles selected according to the scientific journal

Slightly above three-quarters of the selected articles were published during the past four years (Figure 2). As social media and review websites started to gain popularity among consumers, data mining studies and the development of new methodologies also attract the attention of researchers and practitioners of the hospitality industry.

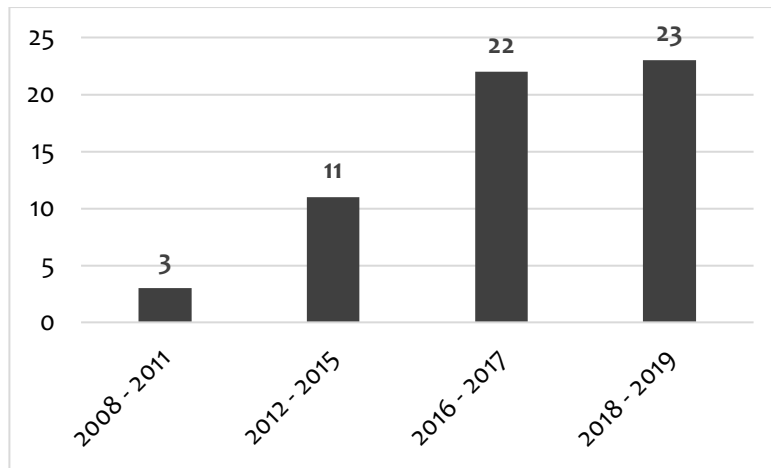


Figure 2. Timeline of the number of publications

When it comes to the geography of the studies, 22 out of 59 publications have chosen hotels located in the United States (37%), followed by hotels located in China, mentioned in seven articles (12%), and the United Kingdom, where hotels are selected by three articles (5%). If markets are segmented by continent, it becomes clearer that North America, Europe and Asia represent the majority of markets analysed (Figure 3). Some articles collected data from hotels located in more than one country (Bacik, Kmeco, Richard, Olearova, & Rigelsky, 2019; Francesco & Roberta, 2019; Li, Law, Vu, Rong, & Zhao, 2015; Lima & Viana, 2017). Additionally, two authors used data samples from mixed destinations across Europe (Bulchand-Gidumal, Melián-González, & López-Valcárcel, 2011; Slivar & Bayer, 2017), while two studies extracted data from hotels worldwide (Ahani, Nilashi, Ibrahim, Sanzogni, & Weaven, 2019; Ban, Choi, Choi, Lee, & Kim, 2019). Consequently, Figure 3 below presents 68 entries instead of 59 (total number of selected articles). Finally, in one paper, the hotel location was not mentioned (Wang, Lu, Chi, & Shi, 2015).

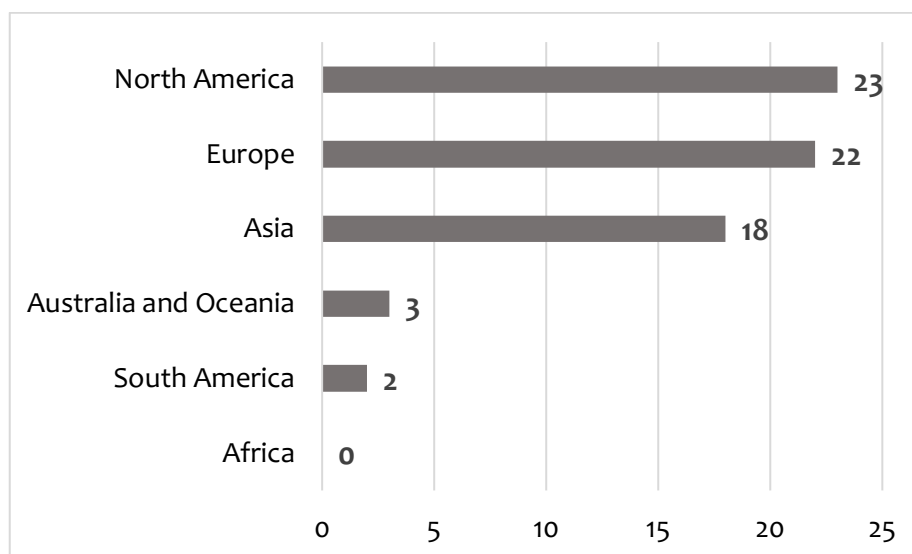


Figure 3. Number of publications according to hotel location. March 20, 2020.

A total number of 35 articles extracted data from TripAdvisor (Figure 4), which figures as the leading global advice website dedicated to tourist products and services with more than 300 million members and 500 million reviews of hotels, restaurants, and other travel-related businesses worldwide (Zhao, Xu, & Wang, 2019). That database is extensively used by scholars and researchers, who wish to explore the usefulness of its countless amount of data from textual reviews in order to find valuable and more accurate managerial implications. The platform stands out in the hospitality industry due to the opportunities for detecting strengths and weaknesses, benchmarking against competitors, measuring customer overall satisfaction, improving hotels image and visibility in the market (Lima & Viana, 2017).

The second source of UGC mostly used by the reviewed papers was Booking.com, internationally recognized as the current leading accommodation booking platform. Besides accumulating a huge amount of online reviews over the years, the platform only allows customers to post rating and reviews if they have booked and stayed at the accommodation, which ensures the authenticity of the information (Xu, Wang, Li, & Haghighi, 2017). Still, it is worth mentioning that some authors opted to work with composite reviews obtained from several sources since they might provide a more complete comprehension of customer trends and behaviours (Kim, Lim, & Brymer, 2015), as well as validate the possibility of combining reviews from multiple sources (Antonio et al., 2018). However, its extraction is considered more challenging due to its open structure and different programming languages and evaluation parameters of each website. As a result, the number of review platforms surpasses the number of articles analysed by this study as shown in Figure 4, as follows:

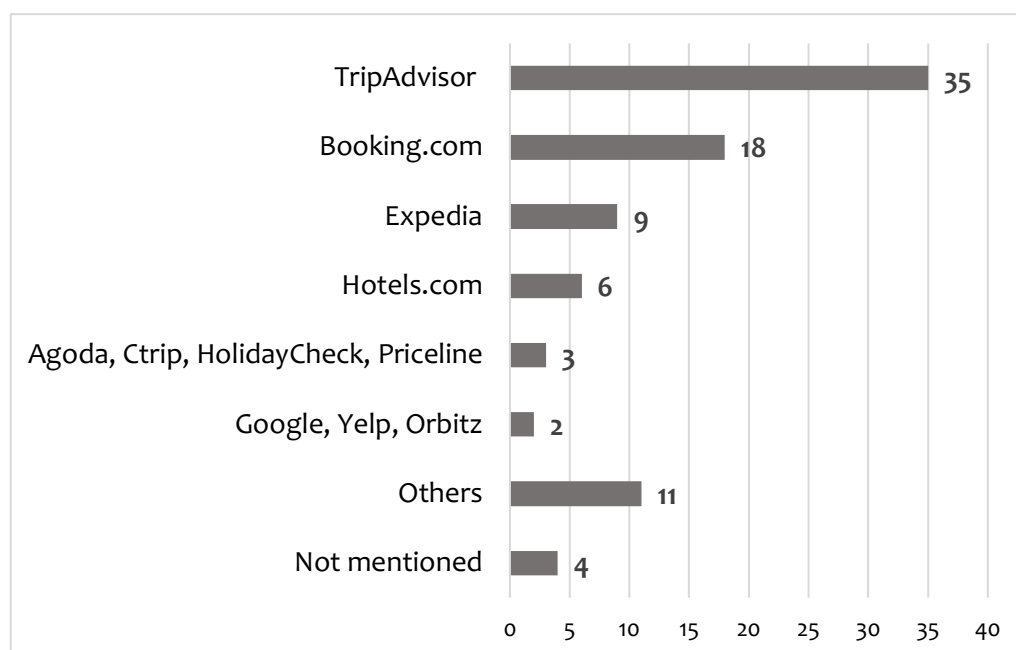


Figure 4. Online reviews platforms used by scholars. March 20, 2020.

3.2 Online review as a tool for hotel businesses improvement

A few years after the first personal opinion was posted on TripAdvisor in 2001, studies on how this user generated content could be explored by hoteliers started being published. As the volume of online guests' evaluation for hotels started to become popular from 2006 (Duan et al., 2016), the oldest article reviewed by this study was published in 2008. By analysing collected reviews through regression analysis and other statistical methods, Jeong and Jeon (2008) found out more about hotel performance attributes that could contribute to guest satisfaction, return intention and recommendation.

Throughout the following years, as new methods and technologies emerge, different approaches and possibilities take place. Also, the number of hotel online reviews posted on booking and opinion platforms increased dramatically on a daily basis, the reason why the advance of new approaches, such as machine learning methods, become crucial in order to keep track of the massive amount of information shared by travellers around the world (Ahani, Nilashi & Ibrahim, 2019; Ahani, Nilashi, Ibrahim, Sanzogni & Weaven, 2019; Xu, 2019).

As pointed out by Ahani, Nilashi and Ibrahim (2019), Ahani, Nilashi, Yadegaridehkordi, Sanzogni, Tarik et al. (2019), Ban et al. (2019), Bi, Liu, Fan and Zhang (2019), Bulchand-Gidumal et al. (2011), Çalı, and Balaman (2019), De Pelsmacker, Van Tilburg and Holthof (2018), Kapilevich, Karvounis and Zagulova (2016), Li et al. (2015), Phillips et al. (2015), Phillips et al. (2017), Raguseo and Vitari (2017), Singh, Torres and Robertson-Ring (2016), Torres, Adler and Behnke (2014), Torres, Singh and Robertson-Ring (2015), Xu (2018), Xu et al. (2017), Zhang and Mao (2012) and Zhao, Fang, Li and Ye (2018), due to their constant update, online reviews and comments must be constantly monitored by hotel marketers and managers for the purpose of identifying accurate improvement necessities, new customers' demands and shifts in behaviour, in this way, enhancing business performance and customers' overall satisfaction. However, due to the large number of reviews that can be posted in a short period of time, an efficient data extraction method is necessary (Bi et al., 2019; Tsujii, Fujita, & Tsuda, 2013; Xu, 2019).

Moreover, hotel businesses should focus on the most reoccurring unfavourable subjects in order to promote successful improvement (Ahani, Nilashi, Yadegaridehkordi et al., 2019; Kim et al., 2015; Tsujii et al., 2013; Zhao et al., 2019; Zhou, Ye, Pearce, & Wu, 2014). Negative reviews should not be ignored since it is an opportunity to improve service quality and adapt to consumer requests (Baltescu, 2016; Bayer & Emir, 2017; Kim et al., 2015; Loo & Leung, 2018). Still, strategies for limiting the number of negative comments must be considered, such as encouraging customers to communicate their dissatisfactions via other channels (Duan et al., 2016; Geetha, Singha, & Sinha,

2017; Zhao et al., 2019). Hu and Chen (2016) even propose a system to measure the impact of unfavourable reviews and inform managers to reply to them at the right time, whilst Moro, Rita and Coelho (2017) suggest a selection procedure for choosing the most suitable user profiles to direct efforts in answering reviews.

Kim and Park (2017), Lui et al. (2018), Torres et al. (2014), Xie, Zhang and Zhang (2014), Xie, Kwok and Wang (2017), Xie, So and Wang (2017), Xie and So (2018) and Xu (2018) recommend managers to adopt effective response strategies to online reviews with a view to increasing business performance. Additionally, Zhao et al. (2019) suggest that hoteliers should focus on online reviews posted by infrequent travellers due to the fact that their perception of hotels tends to be more negative when compared to frequent travellers, whilst Sheng, Amankwah-Amoah, Wang and Khan's (2019) findings reveal that responses to repeated reviewers are not worth it if the aim is improving subsequent review ratings. In short, most scholars come to the conclusion that answering reviews, either positive or negative, has become an important strategy in the hospitality industry. Slivar and Bayer (2017) reveal that many hoteliers, especially branded hotels, have already realized this necessity.

Still, regarding the valence of reviews, studies found that travellers mostly post reviews for showing their positive experience than the negative ones (Bayer and Emir, 2017; Tontini, dos Santos Bento, Milbratz, Volles, & Ferrari, 2017). Additionally, these positive reviews can also offer an overview of customer overall satisfaction with the products and services provided by the hotel, which can provide accurate data for marketers to promote their strengths and attract new customers (Ahani, Nilashi, Yadegaridehkordi et al., 2019). The researchers also confirmed that positive reviews, overall number of reviews, ratings and ranking position on online reviews websites favourably impact RevPAR and booking transactions, what in turn, enhances financial performance (De Pelsmacker et al., 2018; Kim and Park, 2017; Phillips et al., 2015; Phillips et al., 2017; Singh et al., 2016; Torres et al., 2015), however, it was observed by Raguseo and Vitari (2017), that the valence of online reviews exert more influence in the profitability of not-branded chain hotels, which are unfamiliar to the guests and require deeper analysis of potential customers on review platforms.

Another relevant finding obtained through the analysis of online reviews, is that different levels of satisfaction are found, according to the cultural traits and origins of guests, which require hotel managers to analyse in detail the demands of different markets. Therefore, understanding the traveller's preference and satisfaction become essential to better adapt the offer of products and services, besides developing different marketing strategies for each segment (Ahani, Nilashi & Ibrahim, 2019; Ahani, Nilashi, Yadegaridehkordi et al., 2019; Francesco & Roberta, 2019; Mariani &

Predvoditeleva, 2019; Xu, 2018; Xu et al., 2017; Zhou et al., 2014). The researchers also suggest that tailored marketing campaigns on social media can also be more effective if online reviews are used as a tool to track shifts in customer preferences or even segment markets according to their geographical location (Francesco & Roberta, 2019; Mariani & Predvoditeleva, 2019; Zhao et al., 2018).

Guests' online evaluations can also be used by hoteliers to analyse their competitors' reviews. By doing so, hotels can analyse their strengths and weaknesses in relation to their players, benchmark themselves against competitors and make important strategic marketing decisions so as to have a better online image and improve their performance (Baltescu, 2016; Ban et al., 2019; Bayer & Emir, 2017; Mariani & Predvoditeleva, 2019; Tontini et al., 2017; Xu, 2018, 2019; Xu et al., 2017).

Annisa and Surjandari (2019), Baltescu (2016), Ban et al. (2019), Fasone, Hofer and Scuderi (2016), Geetha et al., 2017, Lertputtarak and Samokhin (2017), Li, Ye and Law (2013), Lima and Viana (2017), Limberger, Meira, Añaña and Sohn (2016), Tontini et al. (2017), Xu, (2018, 2019, 2020), Xu et al. (2017), Zhang and Mao (2012) and Zhou et al. (2014) identify through online reviews that intangible services are considered an important core attribute and have a great impact on customer experience, especially among leisure travellers, regardless the geographical area of the studies. Therefore, ensuring staff efficiency and outstanding performance is a must, since it has a correlation with customer overall satisfaction and might lead to complaints and negative reviews when not properly delivered.

Findings also suggest that intangible services must be constantly enhanced by systematic service training and appropriate work environment (Ban et al., 2019; Geetha et al., 2017; Lertputtarak & Samokhin, 2017). Moreover, marketing and front-office departments should team-up to successfully implement strategies in line with customers' feedback and avoid potential gaps between strategies and tactics (Mariani & Predvoditeleva, 2019).

With regard to tangible aspects, studies demonstrate that room quality and F&B have a great impact on overall customer satisfaction, with those attributes alternating ranking positions according to the geography and samples of each study (Annisa & Surjandari, 2019; Baltescu, 2016; Ban et al., 2019; Kim, Li, Han & Kim, 2017; Lertputtarak & Samokhin, 2017; Limberger et al., 2016; Phillips et al., 2017; Tontini et al., 2017). Moreover, it is shown that room quality can directly affect financial profitability and guests' willingness to recommend the accommodation, besides leading to customer grievances and unfavourable reviews when performed under the traveller's expectations (Anagnostopoulou et al., 2019; Baltescu, 2016; Kim, Li et al., 2017; Lertputtarak & Samokhin, 2017; Lima & Viana, 2017; Phillips et al., 2017; Xie et al., 2014; Xu et al., 2017).

In sum, guest reviews reveal that activities that attest the quality of tangible and intangible services should never be neglected by business dedicated to the well-being of their customers, such as hotels (Bacik et al., 2019; Xu, 2019). In fact, the influence of online reviews on a customer's purchase decision is increasing in such a manner that providers of low-quality products in the hospitality industry will gradually be eliminated from the online market, despite offering lower prices (Phillips et al., 2017; Zhao et al., 2018).

Anagnostopoulou et al. (2019) demonstrated that hotel location is a very significant feature when considering profitability, which means that managers should be aware that unchangeable attributes have also an effect on business performance. Kapilevich et al. (2016) verified that strategical location allows hoteliers to charge a higher price. Additionally, Baltescu (2016) finds that online reviews in the hotel industry mainly focus on location and distance from attractions. Lertputtarak and Samokhin (2017) verified that the majority of negative online reviews related to the location were due to the fact that they were far from main roads and tourist spots, even though Fasone et al. (2016) did not find significant differences in perceived hotel quality located near to and distant from the main tourist attractions.

Sustainable practices in the hospitality industry were also addressed through the examination of guest reviews. By collecting guests' reviews of selected hotels in Germany, Gerdt, Wagner and Schewe (2019) found out that sustainability measures that lower guests' perception of comfort, such as water-saving shower heads for instance, might affect guests' satisfaction and lead to unfavourable reviews, one reason why measures that enable guests to decide for themselves whether they want to contribute should be considered. Additionally, Qi, Li, Zhu and Shi (2017) provided suggestions to help Chinese hotels improve their environmental performance without affecting customer's overall satisfaction after analyzing the guest perception of indoor environmental quality through online reviews. Moreover, Kim, Li et al. (2017) found that green initiatives are significative drivers of hotel performance, capable of leading hotels to higher revenues and reducing consumption costs.

Recent studies analysed consumer generated media to identify customer's preferences and satisfaction to help hotel managers and marketers understand travellers' features, prospects, and behaviours through machine learning methods (Ahani, Nilashi & Ibrahim, 2019; Ahani, Nilashi, Ibrahim, Sanzogni & Weaven, 2019; Zhao et al., 2019). Also, novel machine learning approaches enabled the conversion of UGC into a precise market segmentation tool in order to assist hoteliers in the development of more effective marketing and management plans, improvement of resources allocation and formulation of a decision support system to monitor customer

satisfaction and assist hotels in reorganizing their operational activities or marketing strategies (Ahani, Nilashi, Ibrahim, Sanzogni & Weaven, 2019; Çalı, & Balaman, 2019).

In summary, this study shows that the analysis of online reviews has become an indispensable marketing tool for managers due to the fact that their content supplies managers with key information to enhance hotel service and create promotion regarding profit, besides allocating their resources in a more appropriate way. It also becomes clear that customer generated media can be used in several different ways, according to hoteliers' and scholars' purpose. However, the use of appropriate software to collect and analyse large volumes of text would be a requirement for practitioners that would like to explore the full potential of this unbiased, voluntary and available source of information (Ahani, Nilashi & Ibrahim, 2019; Ahani, Nilashi, Yadegaridehkordi et al., 2019; Ban et al., 2019; Çalı, & Balaman, 2019; Francesco & Roberta, 2019; Moro et al., 2017).

4 Discussion

Besides playing an important role in guests' decision-making process when booking a hotel room, online reviews also supply hoteliers with strategical information about their business performance, which can lead to more accurate management decisions. However, this available and open information needs to be properly extracted and analysed in order to assist hoteliers and practitioners of the hotel industry. Several different methods are tested and discussed in each article. However, it is possible to present a general framework of how mostly data mining studies are conducted (Figure 5).

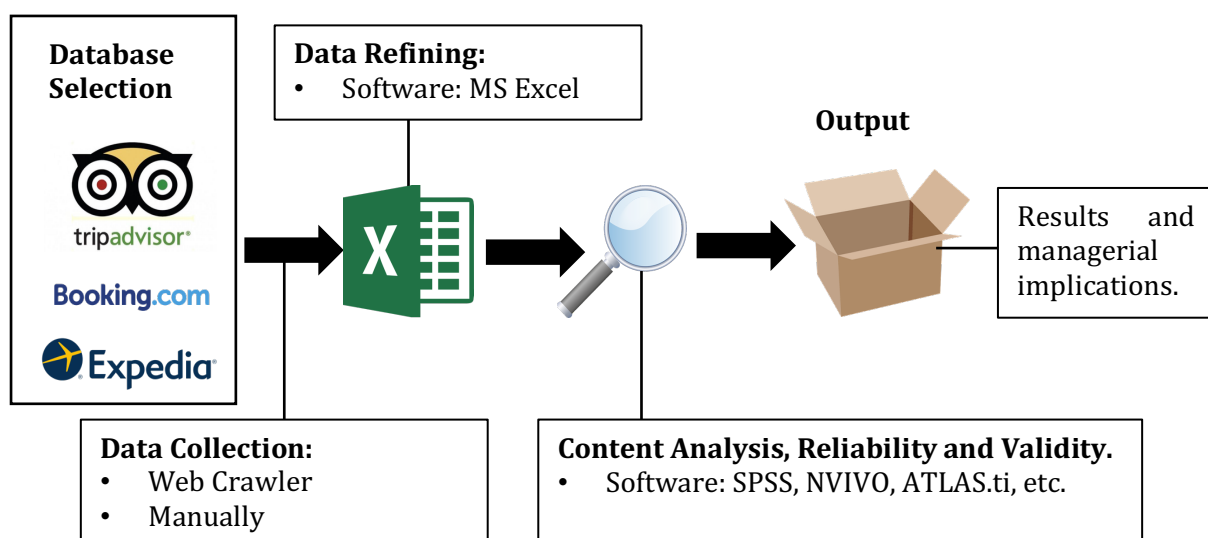


Figure 5. General framework of analysed studies (Adapted from Ban et al., 2019)

Articles analysed in this review extracted data from social media, booking and review websites with the purpose of finding relevant information to assist hoteliers worldwide improving their performance. Studies were mainly conducted in the American, European and Chinese markets. Although similarities among these markets were found regarding the evaluation of core attributes, such as room quality and staff efficiency, cultural market segmentation is recommended in order to find specific demands and offer superior quality products and services.

Regarding data sources, TripAdvisor, Booking and Expedia were the most popular databases among researchers. Some studies mentioned the utilization of a web crawler to download hotel reviews from the internet due to the amount of data to be collected (Bi et al., 2019; Gerdt et al., 2019; Hu & Chen, 2016; Lee, Hu & Lu, 2018; Wang et al., 2015; Xie et al., 2014, Xie, So & Wang, 2017) and a few studies stated that the collection was done manually (Limberger et al., 2016; Loo & Leung, 2018). The authors recognized that manpower and time are great constraints.

If on the one hand, most recent studies state that online review analysis still remains challenging due to their long and open structure, on the other hand, this same open structure provides more details about guests' experiences and perception about the hotels. Fortunately, due to the fast advance of technology, online reviews can be collected and analysed in many different ways (Xu, 2019). Hiring a third-party company may be costly, thus building an effective marketing and management team with some analysis expertise is also a way to take advantage of UGC since data is freely available.

Although this research was able to uncover a significant number of managerial implications and develop a general framework capable of illustrating the main stages of data mining techniques, it is important to point out the most recurrent research gaps identified among the selected works. These gaps can be divided into the following six main categories. The first category would be the limited sample of hotel units, which in many of the analysed studies are unable to represent the entire hotel industry of a location, provide general implications for hoteliers worldwide or reflect a standardized market behaviour. Secondly, many studies opted to work with only one or few locations. This issue prevents their findings from being generalized to other markets. Thirdly, most works have only chosen one or two platforms as a source of online reviews due to the challenging task of extracting ratings and reviews from different websites, since they present different layouts and characteristics. Even so, findings based on data derived from a single platform may not be comprehensive enough to represent all customers. Next, mostly very recent studies do not have their results validated, since these methodologies have not been extended or confirmed by further research. Subsequently, most of the studies only extracted online reviews in their native language or in English, which can obstruct the detection of cross-country and cultural patterns and

behaviours. Lastly, some studies could have performed long-term online review observation to explore the relevance of change of customer perceptions and perceived quality of the business over time. Other research gaps include technical inability to identify issues deriving from human language and impossibility to detect and exclude fake reviews, which can affect results to some degree.

The findings of this study also show that the aforementioned practices are spread across the most consolidated markets. Although important gaps have been identified, the extraction of unstructured text from online reviews, and its further refining and analysis, has allowed scholars to obtain relevant information about overall hotel performance, consumer behaviours, needs of improvement and market demands among other practices presented in this study. Scholars and practitioners must be aware that further knowledge and technical improvement are necessary to conduct the analysis process appropriately in order to obtain the desired results.

5 Conclusion

The main purpose of this study was to verify how online reviews could be used as a tool for hotel business improvement as well as to identify a variety of contributions that the analysis of online reviews could bring to hoteliers, regardless their category, location or size. Through an in-depth analysis of 59 refereed articles, the most recent and recurrent techniques were identified. Furthermore, the articles have been classified according to their journal, year of publication, market region and UGC platform. Additionally, key managerial implications provided by the studies were presented.

Findings suggest that online reviews can be used as an efficient tool for business development in many different ways when efficiently extracted and combined with appropriate analytical methods. Hence, using software devoted to analysing large volumes of text or appealing to third-party companies focused on online review and social media data aggregation is currently necessary, since data mining involves techniques to extract meaningful information from UGC and turn it into a structured form by applying statistical analysis, computational linguistics and machine learning. Also, hotel industry professionals and scholars must clearly define what type of data they want to obtain from online reviews, as methods will undoubtedly differ according to the desired information. If on the one hand, the daily growing number of online reviews requires specific software and data mining knowledge, on the other hand, it may provide hoteliers with more accurate results at a cheaper price when compared to traditional approaches, such as conducting

customer surveys, which are costlier and more time consuming when compared to the novel approaches enabled by recent technologies.

This literature review contributes to the existing literature by extending the current research on the use of online reviews for the hospitality industry. This work also provides important practical contributions. The variety of applications of online reviews presented in this study can provide managers, marketers and other practitioners from the hospitality industry with insights on how to take advantage of online reviews to improve their business performance.

Study limitations include the research approach, which has only focused on practical implications for the hotel industry obtained through the analysis of online reviews. No data mining approaches and analysis methods were studied in depth. Only English, Spanish and Portuguese language articles published from January 2008 to January 2020 were analysed. Future studies could consider the analysis of other material, practical implications for other types of accommodation and more detailed online reviews analysis and data mining approaches. Also, considering the findings that have emerged from this work, validation of results from the most recent studies, long-term online reviews observation, as well as geographical, cultural and language extension of the presented studies should be considered.

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3. Article II: Hotel customer segmentation and sentiment analysis through online reviews: an analysis of selected European markets

Hotel customer segmentation and sentiment analysis through online reviews: an analysis of selected European markets

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ABSTRACT

Purpose: This study aims to verify how distinct markets evaluate a sample of Portuguese hotels located in the Algarve through the analysis of online reviews. In doing so, this paper wants to identify if satisfaction and dissatisfaction attributes are similar among the main markets of overnight stay tourists in the region.

Methodology: This article analyses online textual reviews of hotel units located in the Algarve, written in English, French as well as Portuguese languages and posted on TripAdvisor by British, French and Portuguese residents from January 2019 to December 2019.

Findings: After the conduction of frequency and sentiment analysis of 8,596 online textual reviews about 161 Portuguese hotel units, the results demonstrated that not only satisfaction and dissatisfaction rates towards hotel attributes differ according to the language, but also that customers from different countries place dissimilar emphasis on hotel attributes. Furthermore, these outcomes suggest the use of text analysis as an important tool to better understand guest's perception about hotel features.

Implications: Besides contributing to the existing literature by extending the current research on the use of online reviews and data mining approaches, findings of this study also assist hoteliers to identify improvement opportunities based on the evaluation of three distinct European markets.

Originality: Although many studies on marketing segmentation through data mining have been conducted, this paper analyses customer overall satisfaction of relevant tourist markets and suggests up-to-date practical implications for hoteliers, apart from contributing to extend the research on this field.

Keywords: online reviews, data mining, sentiment analysis, TripAdvisor, hotel management.

1. Introduction

Driven by technological advances and a stronger world economy, the international tourism industry presented a sustained growth for the 9th consecutive year in 2018. The overall number of international tourist arrivals and tourism receipts raised 5.4% and 4.4% respectively worldwide. On top of that, international tourist arrivals increased globally (World Tourism Organization, 2019). However, it is crucial to mention that tourist arrivals dropped by 56% between January and May 2020, when compared to the same period of the previous year, due to the unprecedented global economic crisis caused by the COVID-19 pandemic, which led to borders closures and lockdowns in several countries and cities (World Tourism Organization, 2020).

Still, the European continent, which accounts for half of the world's international arrivals, registered 710 million foreign visitors in 2018, representing an increase of 5%. Portugal reached the impressive mark of 22.8 international arrivals in 2018, a 7.5% growth compared to the previous year, representing 3.2% of all European international arrivals market share (World Tourism Organization, 2019).

Portugal's robust performance in tourism also dynamizes the hotel industry in the country. Portugal has currently 1400 hotels spread across the country and its two autonomous regions, 91 new units compared the previous year and 719 new units when compared to 2009 (PORTDATA, 2019). Moreover, 54.2 million overnight stays were registered among the Portuguese hotels, corresponding to 83.6% of the total overnight stays in 2018. Foreigners stood for 70.6% of the total number of overnight stays and are represented by four major markets: The UK (19.5% of all international overnight stays), Germany (13.5%), Spain (10.2%) and France (9.8%). The domestic market also plays a vital role, since it generated 19.9 million overnight stays in the country, which corresponds to 29.4% of the total and a 6.5% growth in comparison to 2017. Regarding Portugal's tourist regions, the Algarve topped the list overnight stays (30.2%), followed by Lisbon Metropolitan Area (25.9%) (Instituto Nacional de Estatística, 2019).

Considering the cultural traits, language and other particularities of each of the three aforementioned markets, hoteliers must be aware that different origins might lead to different levels of satisfaction. Therefore, it becomes essential to better adapt the offer of hotel products and services, besides developing different marketing strategies for each segment in order to stand out in a competitive market (Ahani, et al., 2019a; Ahani, et. al 2019c; Francesco and Roberta, 2019; Mariani and Predvoditeleva, 2019; Xu, 2018; Xu, et al., 2017; Zhou et al., 2014).

In order to assist hoteliers in achieving this goal, this study intends to take advantage of the current technology and make use of online reviews along with data mining techniques, as previously observed by Oliveira et al. (2020), to verify if satisfaction and dissatisfaction attributes changes significantly among Portugal's main foreign tourist markets as well as the domestic market. This work will take into consideration hotels located in the Algarve, above mentioned as the number one destination for overnight stays in Portugal. By doing so, this paper wants to uncover if the British, French and Portuguese markets differ considerably in terms of overall satisfaction and demands in the region as well as provide managerial implications for hoteliers and contribute to the extension of studies in this field.

Therefore, this study is presented as follows. First, a review of the literature about online reviews and different group of travellers as well as the chosen destination and review platform is conducted. Second, each stage of the proposed methodology is explained. After, the results

of the research are analysed, presented and discussed. Finally, theoretical and practical implications are provided along with research limitations and recommendations for future studies.

2. Literature Review

2.1 Online reviews and different groups of travellers

As formerly observed by Oliveira et al. (2020), previous studies have made use of online reviews to analyse different groups of travellers in the same destination. Antonio et al. (2018) and Phillips et al. (2020) analysed reviews from a set of Portuguese hotels in three different dialects and observed that cultural backgrounds as well as geographic distance influence hotel online reviews as travellers of different origins may have distinct expectancies. Ahani et al. (2019a; 2019c) collected reviews from 5-star hotels in Wellington, New Zealand, and four and five-star hotels in the Canary Islands, Spain, respectively. The findings of both researches detected various degrees of satisfaction with dissimilar preferences among customers and recommended hoteliers to segment travellers' preference and satisfaction through data mining as a way to improve the quality of hotel products and services.

Despite of collecting reviews from four different world capitals, Francesco and Roberta (2019), investigated if travellers from different countries put different emphasis on hotel attributes and if these attributes were perceived differently. After analysing reviews on TripAdvisor written by Italian, American and Chinese travellers, the results also suggested considerable dissimilarities in the sentiments customers were having regarding the hotels.

Mariani and Predvoditeleva (2019) examined the role and influence of guests' cultural traits and perceived experience through online review ratings of Russian hotels and their findings show that different online customer groups can be clustered into segments, as they display different online behaviours and give different online evaluations. Similar online review behaviour, but unique excitement and performance factors of travellers in different group compositions, such as family travellers, couple travellers, group of friends and solo travellers was also observed by Xu (2018). Table 1 presents the main studies observed.

Table 1 – Previous studies on focused on market segmentation through online reviews

Authors	Year	Title	Method	Database	Geography	Key Findings
Phillips et al.	2020	The influence of geographic and psychic distance on online hotel ratings.	Text mining	Booking.com; TripAdvisor	Portugal	The results demonstrate that travellers of different origins may possess significantly different expectations. Moreover, travellers with less psychic and geographic distance give a lower rating score than travellers with greater distance.
Ahani et al.	2019a	Travellers segmentation and choice prediction through online reviews: The case of Wellington's hotels in New Zealand.	Multi-criteria decision making (MCDM); Technique for order of preference by similarity to ideal solution (TOPSIS)	TripAdvisor	New Zealand	The results provide an overview of different segments of travellers' preferences towards 5-star hotels attributes.
Ahani et al.	2019c	Revealing customers' satisfaction and preferences through online review analysis: The case of Canary Islands hotels.	Self-organizing map (SOM); TOPSIS; MCDM	TripAdvisor	Spain	Customers may declare dissimilar service desires that are generally complicated to manage. Results also suggest that having dissimilar preferences affect customers' satisfaction linked to hotel features.
Francesco and Roberta	2019	Cross-country analysis of perception and emphasis of hotel attributes.	Text link analysis	Booking.com	USA, UK, UAE and China	Results highlighted that each group of travellers emphasized hotel attributes differently. Thus, travellers belonging to different countries place different emphasis on hotel attributes.
Mariani and Predvoditeleva	2019	How do online reviewers' cultural traits and perceived experience influence hotel online ratings?	Censored regression; semi-structured interviews	Booking.com	Russia	Findings show that cultural traits exert a significantly influence on hotel online ratings. Reviewers' perceived experience in online reviewing is negatively related to online ratings.
Antonio et al.	2018	Hotel online reviews: different languages, different opinions.	Sentiment analysis	Booking.com; TripAdvisor	Portugal	Results of this study reveal different behaviours toward online reviews depending on their cultural background.
Xu	2018	Does traveller satisfaction differ in various travel group compositions?	Latent semantic analysis (LSA); text regression	Booking.com	USA	Findings of this study show that not all positive and negative textual factors mined from guest's review significantly influenced their overall satisfaction. It was also found that determinants of traveller satisfaction differ in different travel group compositions.

In short, all aforementioned studies registered dissimilarities among guest's satisfaction and preferences when customers presented different cultural traits and background, nationalities or group composition. Accordingly, this study intends to verify if the four chosen European markets also display disparities concerning satisfaction and dissatisfaction factors about hotel products and services offered in the same region.

3. The Algarve

The Algarve has been chosen by this study due to its popularity as a European tourist destination. Its international airport situated in Faro registered 4.3 million arrivals in 2018, which of these, 94.7% corresponded to international flights. Throughout the same year, 4.7 million guests were accounted in the area, of which, 3.4 million (71.2%) non-residents and 1.4 million (28.8%) residents. The region hosted 22% of all foreign tourists the country, performance surpassed only by Lisbon Metropolitan area (35.8%), where the Portuguese capital is located. In 2018, the region reached 1.1 billion euros of global income, of which 852 million euros emanated from accommodation profits. An increase of 6.1% and 5.7% compared to the previous year respectively (Travel BI, 2020).

The Algarve is Portugal's main destination in total number of overnight stays and registered more than one third of the non-resident stays in hotel units (35.8%), followed by Lisbon Metropolitan Area (27.5%). Its most representative foreign market in this aspect is the United Kingdom, constituting 38.2% of the total number of guests that spent at least one night in the area (Instituto Nacional de Estatística, 2019). In regard to the national market, the area registered a significant growth of 10.7% in 2018, totalizing 4.8 million domestic overnight stays. Travel BI (2020) also shows that the majority of the 20.4 million overnight stays in the Algarve (38.9%) opted to stay accommodated in a hotel.

According to Registo Nacional de Turismo (2019), a Portuguese organ responsible for gathering tourism related data in the country, 170 hotels are currently located in the area and most of the units are situated in the region of Albufeira (42 hotel units), followed by Loulé (22 hotel units) and Portimão (29 hotel units). The region accounts for 36.3% of the accommodation capacity (beds) available in the country. Additionally, an average of 289 beds is offered per hotel unit, the highest volume among all Portuguese regions (Instituto Nacional de Estatística, 2019).

Therefore, it is increasingly necessary for hoteliers to expand their knowledge about strategic markets in this region, since the hotel industry is very competitive and plays a vital role in the area. Undoubtedly, the tourism industry has a major impact in the Algarve's economy, the reason why hoteliers must improve their marketing strategies and efficiency in order to deliver high-quality service and products to their customers.

4. Methodology

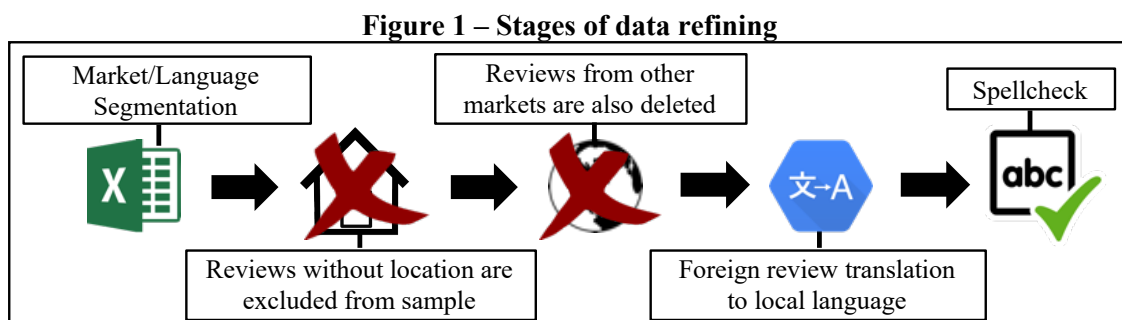
4.1 Sampling and data collection

In order to accomplish the tasks proposed by this study, online reviews of hotels located in the Algarve written by guests who reside in the UK, France and Portugal must be collected from TripAdvisor. First, it was necessary to check if all 170 hotels listed by Registo Nacional de Turismo (2019), were available on TripAdvisor's website. All hotels were searched on the review platform, according to their names, address, postal code and the official website. A total of 161 hotels were considered eligible to have their reviews collected. Among the excluded sample, four hotels had duplicated entries, two establishments have not been reviewed, one accommodation had only one review, one hotel have been converted into a hostel and one unit was not found.

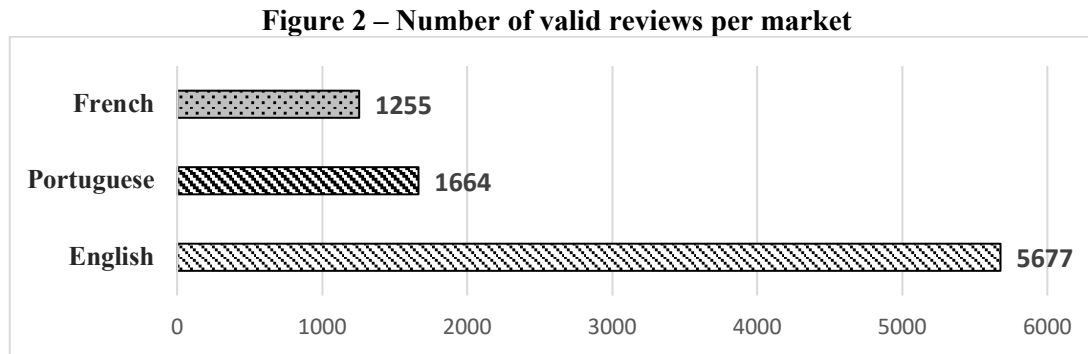
The second stage consisted in extracting the reviews of the selected hotels. First, each hotel unit has been given a singular ID number. Second, each hotel website link on TripAdvisor was included in an Excel spreadsheet and a bot built in C# has been used as a web scraper to collect online reviews posted from January 2019 to December 2019. A total of 15,585 ratings and text reviews written in three different languages (English, French and Portuguese) were obtained from the platform. Also, username and country of residence related to each rating and text review were collected.

4.2 Data refining

Data refining is an essential process when analysing a large volume of text. This extensive procedure consists mainly of converting unstructured text data into structured forms (Ban et al., 2019). Consequently, a five-stage process shown in Figure 1 is conducted with the purpose of promoting as accurate data analysis as possible. First, the text reviews are segmented by language in an Excel spreadsheet to facilitate further market segmentation. Second, reviews missing the city or country of residence are excluded from the sample, since it precludes market segmentation. Next, all reviews in which users are not from the target markets are also excluded leading to a sample of 8,596 valid reviews. Then, with the help of an online translator, all reviews written in the foreign languages covered by this study were translated to their original language and segmented accordingly (for example, a review posted by a French resident in English is translated into French and segmented as French market). Finally, with the assistance of an online spell checker, all reviews are revised in order to be correctly interpreted by a further analysis software.



As aforementioned, the United Kingdom is Algarve's most representative foreign market, representing almost 40% of the total overnight guests in the area. Its representation is reflected in the total number of reviews (5,677), which surpasses the number of Portuguese (1,664) and French (1,255) reviews combined. Figure 2 presents the final amount of valid reviews for each of the selected markets.



4.3 Sentiment analysis

Sentiment analysis, also known as opinion mining, is the field of study responsible for analysing individuals' reviews, opinions, sentiments and emotions towards products and services. This type of investigation mainly focuses on positive or negative sentiments expressed on people's opinions (Liu, 2012). It is also described as a computational study that investigates texts, which include someone's opinion about a specific business, such as hotel reviews (Çalı and Balaman, 2019).

It is also through the conduction of opinion mining that a more precise interpretation of text reviews is assured, since this method aims to classify texts according to their sentiment orientation. This categorization can be binary (positive, negative), ternary (positive, neutral, negative) or to the context of reviews, as for instance, thumbs up or thumbs down, approval or disapproval (Çalı and Balaman, 2019; Duan et al., 2016; Han et al., 2016).

Travellers' online reviews contain objective and subjective statements about hotels and travel experiences. Consequently, the sentiment analysis' main aim is to deal with the subjective expressions utilized to describe emotions, opinions and feelings (Çalı and Balaman, 2019; Liu, 2012). Moreover, sentiment analysis is proven to be an important tool to quantify guest's opinions in the textual component of reviews (Antonio et al. 2018). Thereby, as a means to reach the goals proposed by this research, a lexicon-based approach sentiment analysis is adopted to identify the polarity of each selected online review. By doing so, it will be possible to uncover and classify any relevant semantic and emotional information regarding the targeted markets selected by this study.

4.4 Data analysis

Throughout the years, TripAdvisor's database has become noticeable in the hospitality industry due to the fact that its extraction and handling eases the detection of business strengths and weaknesses, benchmark against competitors, measurement of customer overall satisfaction,

hotels image improvement and market visibility (Lima and Viana, 2017). The platform is also widely used by scholars in pursuit of useful and strategical information regarding the hotel industry. Ahani et al. (2019a, 2019c), Ahani et al. (2019b), Han et al. (2016), Hu and Chen (2016), Li et al. (2015), Litvin (2019), Yi et al. (2018), Yu et al. (2017), Zhao et al. (2019) are recent examples of studies that made use of TripAdvisor as a primary source of information to identify customer overall satisfaction, preferences and segment markets to provide new insights as well as managerial and theoretical implications. Hence, the online textual reviews analysed in this study are open and unstructured data acquired from TripAdvisor. Even though the data has been previously refined, some of the challenges faced by this research are the impossibility to employ direct analysis methods, such as standard statistical or econometric procedures, and also to deal with a substantial number of reviews, which can be very time consuming and lead to biased results if done manually (Han et al., 2016; Limberger et al., 2016; Loo and Leung, 2018).

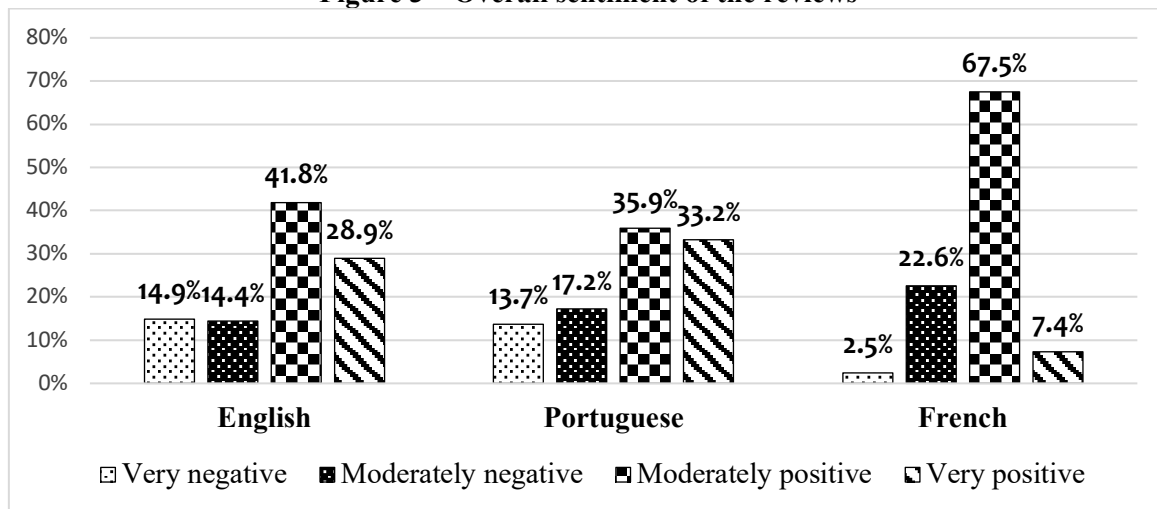
For this reason and as pointed out by recent studies such as Ahani et al. (2019a); Ban et al. (2019); Çalı and Balamán, (2019); Francesco and Roberta, (2019) and Oliveira et al. (2020), an appropriate software devoted to analysing large quantity of data is required. Therefore NVivo 12, a tool developed to assist researchers in qualitative data analysis, was chosen to assist the following content analysis of this study. The chosen tool is then used for the following procedures: First, all refined data has been imported into NVivo 12 separately. After that, three different projects were created. One for each market and local language (English, Portuguese and French). Next, a general sentence level sentiment analysis is carried out to detect the sentiment polarity in each sentence of the text reviews. By doing so, this study aims to identify the overall sentiment of each market towards their hotel experience in the Algarve. In this first inquiry, the total amount of reviews and all their content were taken into consideration. Then, a frequency analysis is conducted in order to rank the 30 most frequent nouns related to hotel attributes. As a result, it was possible to uncover which hotel attributes are mostly discussed by each market in the online reviews posted on TripAdvisor. Also, frequency analysis allowed to identify common codes, also known as themes, which helped to define which hotel attributes could be compared afterwards. Finally, an aspect level sentiment analysis was conducted to identify the sentiment polarity of opinions expressed on seven different hotel attributes, namely: room, pool, staff, breakfast, restaurant, beach and view. Finally, a comparison between all three markets are performed.

5. Findings

5.1 Comparison of overall market sentiment analysis

As shown in Figure 3, the results obtained from the general sentence level sentiment analysis present a binary categorization of the sentiment found in the total number of reviews of each market. The automatic process carried by NVivo 12 applies a scoring system where each word containing sentiment has a pre-defined score and it is classified on a Likert-type sentiment scale under the following labels: very negative, moderately negative, moderately positive and very positive. It is possible to visualize that English and Portuguese reviews followed a similar pattern, while French reviews remained centred in the two moderately groups. Still, all three markets wrote more positive sentences than negative ones in their reviews, which validates Bayer and Emir, (2017) as well as Tontini et al. (2017)'s findings that travellers mainly write reviews to share their positive experiences instead of the negative ones. The English, Portuguese and French market presented respectively 71%, 69%, 75% of absolute positive sentiment towards their hotel experience in the Algarve, which represents an average of 71.6%. In terms of overall satisfaction, results show that, if on the one hand, the local market shows a higher percentage of very positive sentiment, on the other hand, it is behind the two other markets in terms of general positive sentiment. Furthermore, although presenting a very low percentage of very positive sentiment, the French residents' reviews display three quarters of positive sentiment.

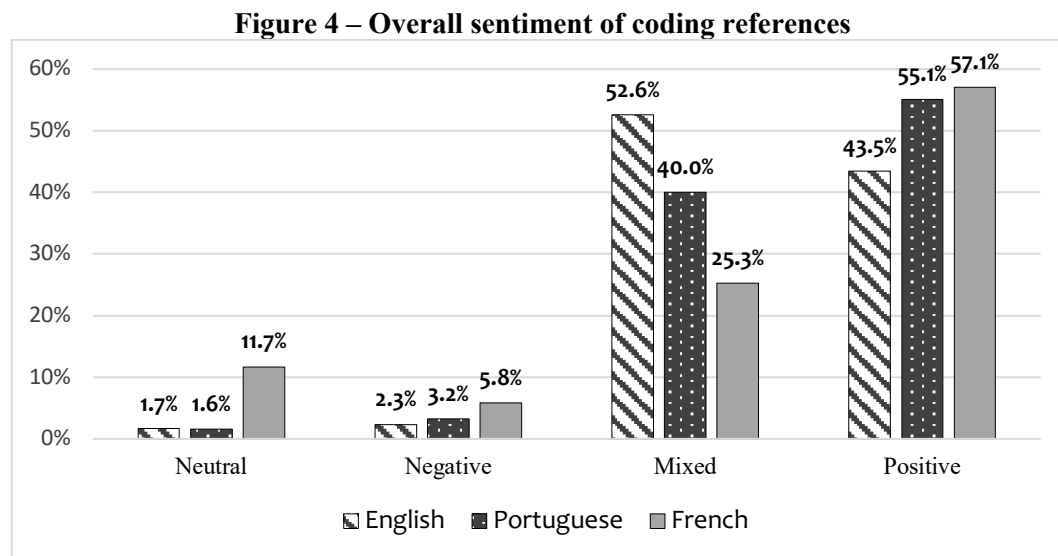
Figure 3 – Overall sentiment of the reviews



When conducting the sentiment analysis of the unstructured data, NVivo searches for expressions of sentiment in the source material, however, it is important to highlight that the tool only can analyse one language at a time and does not recognize sarcasm, double negatives, slangs, dialect variations, idioms or ambiguity. Still, the software provides a handy overview when it comes to the analysis of a large volume of data in a short period of time.

Regarding the total number of sentiment coding references in relation to the total number of reviews detected on each language, it was verified that slightly over 10% of French reviews were classified as neutral. In other words, these coding references were considered to have no sentiment at all. In turn, English and Portuguese text reviews had less than 2% of neutral coding

references detected. Also, French reviews presented more negative coding references (5.8%), which represents more negative mentions than the two other markets summed. Concerning mixed references, when you have both positive and negative sentiments identified in the same text passage, results show that more than half of the English reviews (52.6%) mention pros and cons about their hotel experience on a single TripAdvisor review. This pattern of writing reviews was followed by the Portuguese (40%) and only by a quarter of the French posts. With regard to positive coding references, these were mainly detected on French reviews (57.1%), followed by Portuguese (55.1%) and English samples (43.5%). Figure 4 shows the comparison among all three markets.



5.2 Frequency analysis

As previously performed by Antonio et al. (2018), Ban et al. (2019), Gerdt et al. (2019), as well as Khoo-Lattimore and Ekiz (2014) a frequency analysis was conducted in order to uncover the 30 most mentioned words associated with hotel experience in each language. This type of analysis is essential, especially at the beginning of the textual data analysis, since it can assist in identifying which hotel attributes are mostly discussed and assessed in the reviews, besides revealing significant results about the interaction between what is written in all three different languages.

Taking this into account, unrelated words, verbs, adjectives, articles, conjunctions, prepositions, pronouns and others were excluded from the query. Only nouns related to hotel attributes were maintained. Also, the word hotel, which was the most frequent noun in the reviews was removed since it is not a hotel attribute, but the hotel unit itself. As shown in Table 2, after conducting the word search query in each one of the languages, it was found that room, staff and pool are respectively the three most mentioned words, regardless the language it was written. A similar result is found in Khoo-Lattimore and Ekiz (2014), which found room, staff and food as the most recurrent themes. Also, six terms amongst the top ten most mentioned words are the same in all languages. Apart from the three words aforementioned, breakfast, restaurant and beach figure amongst the ten most cited hotel attributes.

The outcomes of this query support the selection of hotel attributes that are going to have their sentiment detected and contrasted among all selected markets in order to answer whether

satisfaction and dissatisfaction attributes are similar among the British, French and Portuguese markets.

Table 2 – Frequency analysis results

English			Portuguese		French	
1	room	2.21%	quarto	2.09%	chambre	2.15%
2	staff	1.56%	funcionários	1.81%	personnel	1.31%
3	pool	1.39%	piscina	1.32%	piscines	1.22%
4	food	0.96%	café da manhã	1.28%	club	0.83%
5	breakfast	0.92%	praia	0.99%	restaurant	0.77%
6	bars	0.92%	localização	0.83%	plage	0.70%
7	cleaning	0.89%	qualidade	0.80%	vue	0.68%
8	restaurant	0.88%	serviços	0.73%	petit-déjeuner	0.66%
9	days	0.85%	restaurante	0.65%	séjours	0.65%
10	beach	0.77%	estrelas	0.51%	salle	0.57%

5.3 Automatic and manual theme coding

After conducting the word search query, an automatic coding process is executed on NVivo to identify the most relevant themes in each one of the three languages. The unstructured data are analysed by NVivo 12 with the assistance of a language pack. Themes are then automatically detected by analysing the content and the sentence structure within it. In doing so, the significance is assigned to some themes over others based on how frequently they occur in the reviews.

The themes found by the tool are combined into groups and the results are presented as a code for each broad idea, with child codes attached to each main theme. All the relevant content is coded to the theme codes that are created. The results are summarized in a code matrix which shows the codes for each broad idea, and the number of coding references from each source. Still, human supervision is necessary since text analytics is a complex process and manual coding is always going to be more accurate owing to the fact that human sentiments, such as sarcasm, slangs, idioms or ambiguity cannot be identified by the tool.

During human checking process, it was verified that the French and Brazilian Portuguese expressions for breakfast, respectively ‘petit-déjeuner’ and ‘café da manhã’ were broken into different themes. When separate, the word ‘petit’ means small and ‘déjeuner’ means lunch. Hence, human supervision was necessary to identify if customers were evaluating breakfast, lunch or saying that something was small. The same applies to the expression ‘café da manhã’. It was necessary to check if comments were related to breakfast (café da manhã), coffee (café) or morning (manhã). Also, similar themes were merged. For example, ‘hôtel’ and ‘l’hôtel’ (the hotel) were unified among French themes. ‘Pool’ and ‘pool area’ were merged among English themes, since their comments were related to the same hotel attribute.

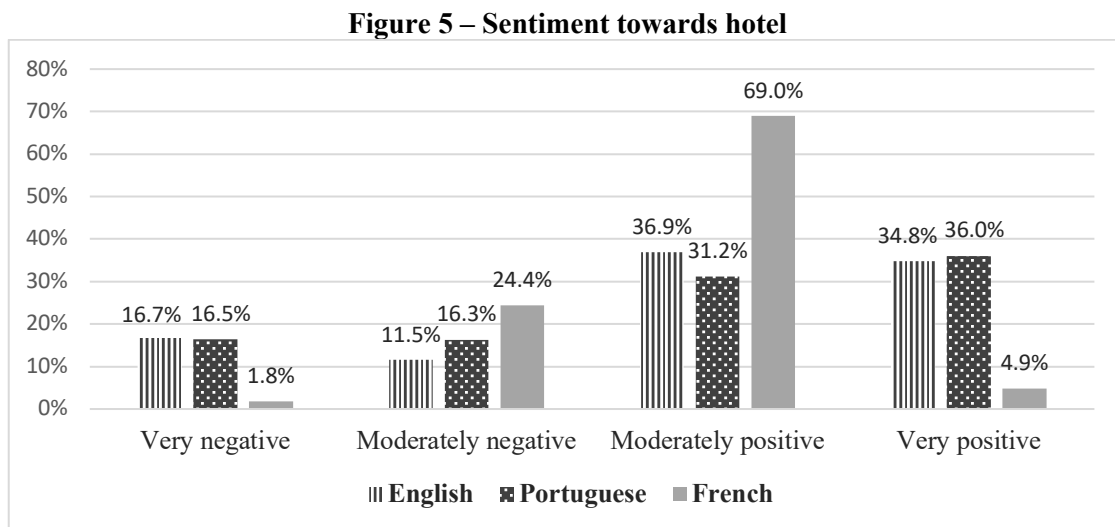
Finally, taking into account the theme coding results and the frequency word outcomes, six hotel attributes are chosen to have their sentiment compared: staff; breakfast; restaurant; pool; room and beach. Besides figuring among the most ten frequent words in all languages, these expressions are also among the most mentioned detected themes. Furthermore, sentiment

towards the theme ‘hotel’ is also checked in the interest of verifying how hotels in the Algarve are evaluated by the selected markets.

5.4 Sentiment analysis towards selected hotel attributes

Following themes coding and selection, each hotel attribute is individually submitted to a sentiment analysis performed by NVivo 12. Next, the outcomes are compared between all markets to verify if satisfaction and dissatisfaction attributes are similar among them. However, a prior sentiment analysis towards the theme hotel is conducted with the purpose of verifying the selected markets’ general opinion about the topic.

As shown in Figure 5, Portuguese reviews show the highest overall level of dissatisfaction over hotels (32.8%), followed by English (28.2%) and French reviews (26.2%). With respect to positive sentiment, French reviews present almost three quarters (73.9%) of approving text content, on the other hand only 4.9% were detected as very positive, which is almost seven times less strong positive sentiment when compared to English reviews (34.8%) and Portuguese reviews (36.0%). According to previous results shown in Figure 4, French reviews sentiments are significantly centred in moderate sentiment levels, whilst English and Portuguese reviews are similarly distributed. Still, as shown in Figure 5, considerable sentiment differences are observed amongst all languages.



With regard to the verified hotel attributes, other dissimilarities are observed as presented in Figure 6. When both moderately positive and very positive sentiment are summed up, reviews written in French stand out among all six selected attributes. That leads to the conclusion that French reviews are in general more positive than the two others analysed languages. Nevertheless, a significant small amount of very positive sentiment is found in French reviews. Staff is the hotel attribute in which the highest percentage of very positive sentiment was found (11%). Breakfast is the feature with the highest rate of moderately positive sentiment (93.8%) and absolute positive sentiment in French reviews (93.8%), while Room is the most criticized. Not only approximately 30 percent of negative sentiment towards hotel room is detected, but also the highest amount of very negative sentiment (4.3%).

With respect to English reviews, the highest absolute value of positive sentiment is found towards beach (81.3%), followed by staff (73.7%) and restaurant (73.5%). When it comes to very positive sentiment, staff is the most praised hotel feature among English residents (40.2%). At the other end, as observed in the French reviews, room presents the highest negative sentiment rate, both on an absolute (33%) and very negative sentiment rate (20.9%). Finally, Portuguese reviews present the highest level of very positive sentiment towards one single attribute: beach (50.6%), followed by breakfast (40.7%) and pool (37.4%). Beach also corresponds to the highest absolute positive rate of Portuguese reviews (77.1%). In regard to whole negative sentiment, Portuguese reviews also demonstrated most of their dissatisfaction towards room (34.1%), followed by staff (33.1%), which was also the attribute where most of the very negative reviews were focused on (16.7%). Figure 6 shows the sentiment comparison between all three languages towards each hotel feature.

Figure 6 –Sentiment towards hotel attributes

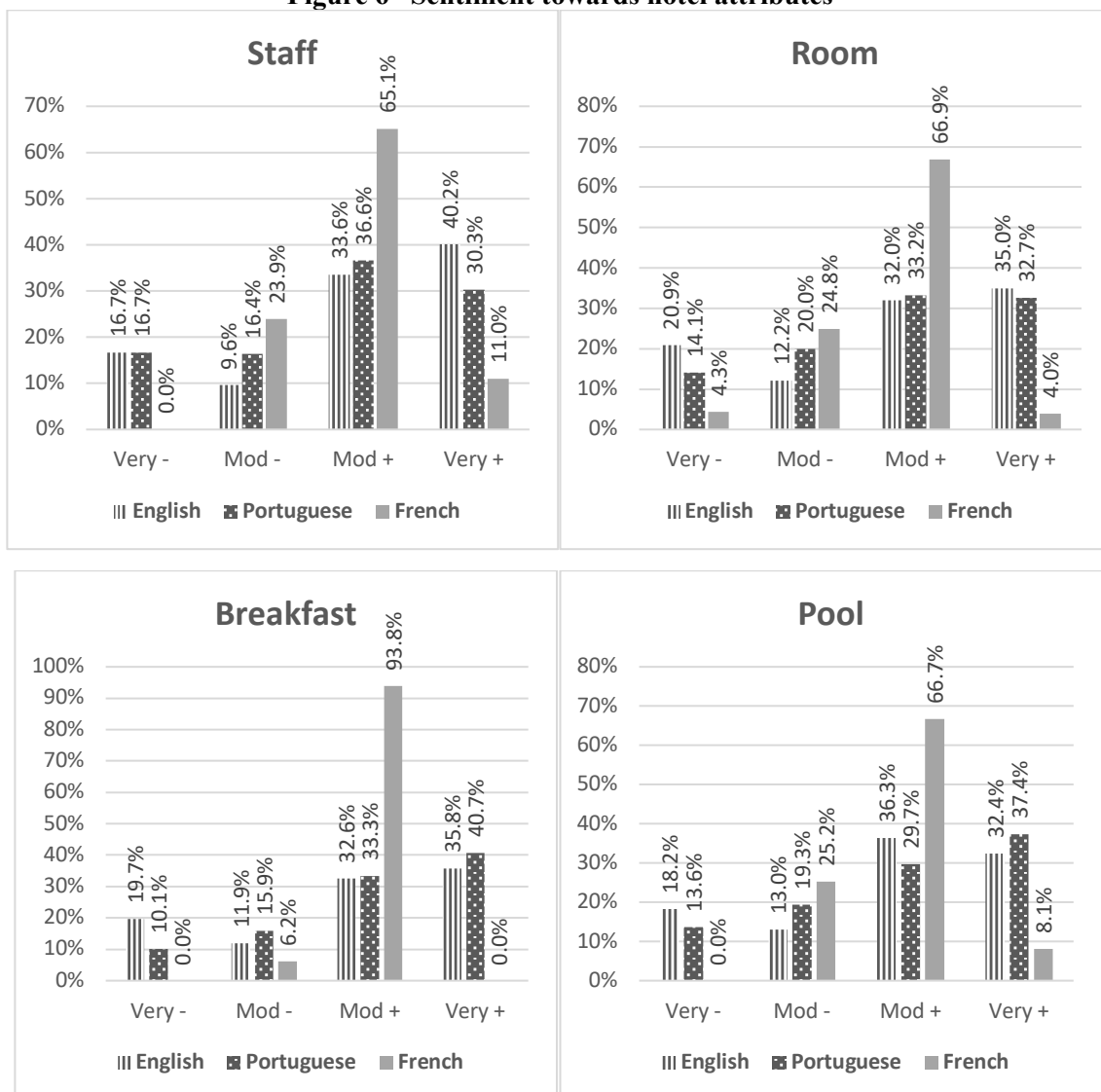
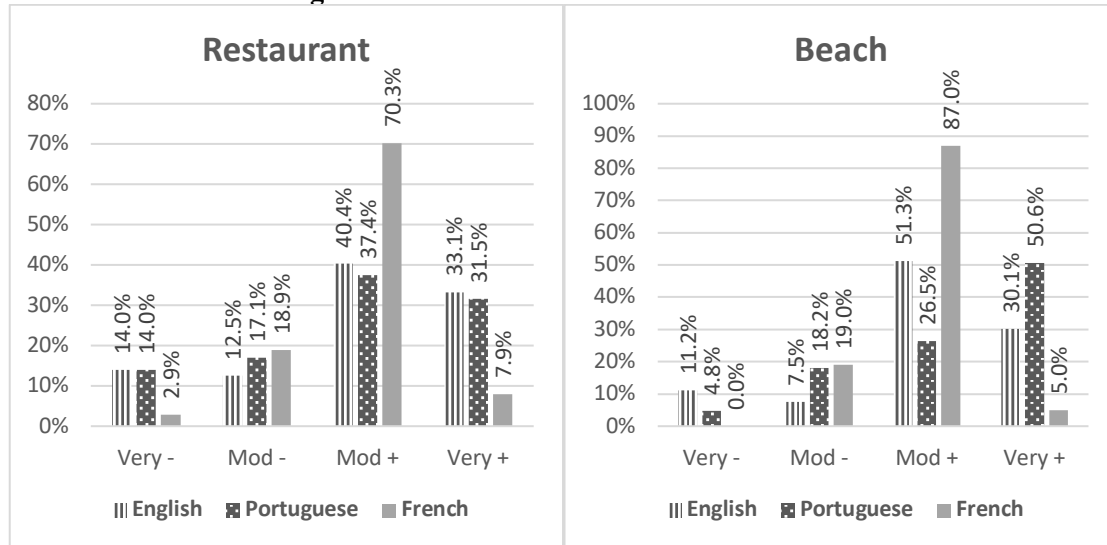


Figure 6 –Sentiment towards hotel attributes



6. Discussion and research implications

In line with Ahani et al. (2019b), Antonio et al. (2018), Francesco and Roberta (2019), Mariani and Predvoditeleva (2019), as well as Philips et al. (2020), the outcomes of this study identified different perceptions and opinions from the selected markets when posting online reviews on TripAdvisor. Although some similarities amongst satisfaction and dissatisfaction towards hotel attributes have been observed, in general, English, French and Portuguese online reviews share different opinions about their hotel stay experience in the Algarve. Hence, findings validate the fact that opinions expressed on online reviews might differ depending on guest's cultural background as well as geographic distance.

The results showed the English reviews manifested the highest rates of very positive sentiment towards staff (40.2%), breakfast (35.8%) and room (35%), respectively. Portuguese reviews focused favourable strong sentiment towards beach (50.6%), breakfast (40.7%) and pool (37.4%). In turn, French reviews had their higher positive sentiment rates towards staff (11%), pool (8.1%) and restaurant (7.9%) accordingly. Despite the fact that staff, breakfast and pool are very positively evaluated by two of the three different markets, these attributes do not present the same rate of satisfaction, which indicates different emphasis and perceptions towards hotel attributes.

If on the one hand, staff is highly appreciated by British residents, accumulating the highest rate of very positive sentiment (40.2%) and the second highest rate of absolute positive sentiment (73.7%) (beach is the first one - 81.3%), on the other hand, the same feature mustered the second highest rate of whole negative sentiment in Portuguese reviews (33%) (room presented the highest whole negative sentiment rate – 34.1%). That not only demonstrates different market opinions, but also denotes that hoteliers must make some adjustments to better satisfy their local market in that specific attribute.

Furthermore, it is noticed a different pattern regarding French reviews sentiment. Even though absolute positive or negative sentiment rates did not present significant fluctuation in comparison with English and Portuguese reviews, a very low rate of strong sentiment is detected. These results may indicate that French residents are satisfied with all hotel attributes, however, there is still room to surpass their expectations. Results also show that, when moderately positive and very positive reviews are summed up, French reviews present a higher

rate of absolute positive sentiment than English and Portuguese reviews towards all attributes. Still, in line with Antonio et al. (2018), English reviews presented more sentiment strength than Portuguese reviews.

The findings of this study not only reinforce Philips et al. (2020)'s statement that online travellers' opinions are multifaceted constructs displaying varying patterns of rating behaviour, but also reveals significant dissimilarities among travellers based on geographic distances. In addition, such as Francesco and Roberta (2019), the outcomes demonstrate that travellers belonging to distinct countries place dissimilar emphasis on hotel attributes, as sentiment strength towards hotel attributes diverted in each language.

According to general outcomes of this study, hoteliers should prioritize room quality, since this specific hotel attribute is the most mentioned in all languages and gathers the highest average rate of absolute negative reviews (32.1%), which represents one third of all negative sentiment in all the observed languages. Moreover, special attention should be paid to pool maintenance, quality and condition as this feature has an average rate of 29.8% of whole negative sentiment besides being the third most mentioned hotel feature by all three markets. Ranked third on this list and mainly criticized by the local market is staff (27.7%). Apart from being the second most mentioned word in all languages, such results reinforce that staff issues also need to be addressed by hotels, such as providing adequate number of personnel and training, besides assuring empathy and efficiency to provide clients with a high-quality service.

Regarding the average rate of absolute positive reviews, findings show that hotels located next to the beach can take advantage of this feature when promoting their business, since this attribute presents an average rate of 83.5%. Additionally, the results suggest that breakfast, which presented the second highest satisfaction rate among all markets (78.7%), can contribute to increase customer satisfaction, especially in the French market, which demonstrated a high approval of this feature. Finally, restaurant was the third highest average satisfaction rate and hoteliers can exploit this feature to attract customers from the selected markets. As pointed out by Khoo-Lattimore and Ekiz (2014), positive feedback from guest provides guidance to the maintenance of ongoing excellence in customer satisfaction and may also result in favourable e-word-of-mouth and recommendations.

This study consolidates the fact that a text analytics software can be a useful tool to assist with word frequency queries and sentiment analysis, however, human supervision is strictly necessary to minimize bias and improve the accuracy of the results. Furthermore, this research confirms that sentiment analysis is a useful tool to quantify the textual reviews posted by guests in foreign languages, extending the findings of Antonio et al. (2018). In closing, hotels can allocate their limited market budget more accurately when their target markets opinions towards the products and services are comprehended and recognized. Hence, data mining and text analysis is proven to be an efficient tool in order to assist hotel business to adequate and improve their offerings.

7. Conclusion

The central objective of this study was to analyse if residents of the United Kingdom, France and Portugal presented significant different sentiment towards hotels and hotel attributes in the Algarve. After the analysis of 8,596 online reviews related to 161 Portuguese hotel units posted on TripAdvisor between January 1st and December 31st 2019, the results show that, although some similarities amongst satisfaction and dissatisfaction with regard to hotel attributes have been observed, opinions towards online reviews might differ depending on the geographic distance or cultural differences.

In line with Ahani et al. (2019a; 2019b), Antonio et al. (2018), Francesco and Roberta (2019), Mariani and Predvoditeleva (2019) and Philips et al. (2020), the outcomes of the present study can assist hoteliers with up-to-date practical implications to better understand the priorities and needs of three different European markets in order to develop specific strategies or better allocate their market and product improvement budget. This work also contributes to the existing literature by extending the current research on the use of online reviews in the hospitality industry through data mining and text analysis, namely frequency and sentiment analysis.

This study presents limitations that must be considered. First of all, TripAdvisor was the only platform examined by this study. Additionally, the sample size has been limited since only reviews from British, French and Portuguese residents about hotels located in the Algarve and during the year of 2019 were considered, thus results of this study cannot be generalised. Future studies can validate the aforementioned results applying different data mining techniques or comparing findings with data obtained from other platforms. Furthermore, the findings of this study can be extended to other countries, periods, different hotel attributes or even uncover which reasons lead to satisfaction and dissatisfaction rates of each market towards the selected hotel attributes.

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3. General discussion

The outcomes of both studies provided a comprehensive overview on how online reviews can be used by hoteliers and practitioners as a strategic tool to improve hotel performance. However, findings also demonstrate the need of appropriate know-how and software to extract and analyse data from review platforms. A general framework to perform online review analysis emerged from the systematic literature review and was validated at the second stage of the work, when all steps were followed in order to verify if satisfaction and dissatisfaction attributes were similar among the main markets of overnight stay tourists in the Algarve.

In accordance with the framework developed by Oliveira et al. (2020), TripAdvisor pointed out as one of the most popular review websites, was selected as the online review database. Next, a bot built in C# has been used as a web scraper to collect online reviews. Due to the massive amount of data available, this step could not be performed manually, otherwise the paper's submission date would be compromised, as already stated in Limberger et al. (2016) and Loo and Leung (2018).

In fact, online review analysis remains challenging due to their long and open structure. That is validated during the second stage of this work, in which all the steps of data extraction and refining proved to be very time consuming, however, all struggle may be worthwhile and bring valuable insights to those in search of accurate management and marketing improvement. As stated by Xu (2019), data analysis can be conducted in many different ways, thus NVivo was chosen as the most appropriate software to perform both frequency and sentiment analysis during the second part of this work.

The results of frequency and sentiment analysis identified different perceptions and opinions of the British, French and Portuguese markets about the 161 hotels located in the Algarve. Although a few common perceptions have been observed, such as positive sentiment rates towards the same hotel attributes, in general, English, French and Portuguese online reviews share different opinions about their experience with these hotels based in the Algarve. Therefore, the outcomes validate that opinions expressed in online reviews might be different according to the country of residence and cultural background.

While the first stage of this work uncovered some of the ways to perform textual data analysis, which has supported the execution of the second part of this work, the findings obtained through the examination of online reviews were able to demonstrate that residents of different countries place distinct emphasis on hotel features. Additionally, this study validates the use of appropriate software to perform word frequency queries and sentiment analysis, however, human supervision is vital to assure the accuracy of the results. The Findings of both studies can assist hoteliers in allocating their limited market budget more accurately when executing online review analysis efficiently. Lastly, data mining and text analysis are proven to be a useful tool to adjust and improve their offerings. In doing so, all the questions proposed by this study were answered in their entirety.

4. General conclusion

The main purpose of this work was to verify how the analysis of online reviews can support hoteliers to improve their business performance, besides uncovering a range of managerial contributions. Also, through the conduction of text mining techniques and online review analysis, the second stage of this work aimed to verify if British, French and Portuguese residents demonstrate different sentiment towards the attributes of hotels located in the Algarve.

After an in-depth analysis of 59 refereed articles, the most frequent and up-to-date data mining techniques were presented. Also, the analysis of 8,596 online reviews posted on TripAdvisor in 2019, regarding 161 hotel units located in the Algarve revealed that, although some similarities amongst satisfaction and dissatisfaction towards hotel attributes have been found, guests' opinions and perceptions may mainly differ due to geographic distance and cultural background.

The outcomes of both studies can assist practitioners with up-to-date practical implications to better comprehend customer demands with a view to develop new strategies and better allocate their marketing budget. This work also contributes to the existing literature by extending the current research on the use of online reviews in the hospitality industry.

Although both articles provide a significant number of managerial implications and extend literature research on online reviews, this study presents limitations that must be considered. First, neither data mining approaches nor analysis methods were studied in depth during the literature review. Also, only articles written in English, Spanish and Portuguese and published from January 2008 to January 2020 were analysed. Regarding the second stage of this work, only reviews written in English, French and Portuguese posted on TripAdvisor by identified residents of the United Kingdom, France and Portugal were analysed. Therefore, the results cannot be generalised to other markets, even though the language is the same. Future studies could consider other types of accommodation for both types of methodologies, validation of results from the most recent studies, including the second stage of this work. Additionally, the methodologies applied in this work could be extended to other countries, time periods or different hotel attributes. Uncover which reasons lead to satisfaction and dissatisfaction rates of each market towards the selected hotel attributes should also be considered.

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APPENDIX A - Proof of submission DAMEJ ITMN Special Issue

Submitted – March 23, 2020

30/09/2020

Gmail - Submissão de Artigo ITMN special issue - Online reviews: a pathway to improve hotel management



Anderson S. Oliveira <anderson.sp655@gmail.com>

Submissão de Artigo ITMN special issue - Online reviews: a pathway to improve hotel management

Anderson S. Oliveira <anderson.sp655@gmail.com>

23 de março de 2020 às 22:34

Para: dosalgarves@ualg.pt

Cc: ktorking@ualg.pt, Ana Isabel da Silva Aço Renda <arenda@ualg.pt>, Marisol de Brito Correia <mcorreia@ualg.pt>, a63247@ualg.pt

À

Dos Algarves - A Multidisciplinary e-Journal

Com conhecimento para ktorking@ualg.pt;

Profª Ana Renda;

Profª Marisol Correia

Comunico a submissão do manuscrito "Online reviews: a pathway to improve hotel management" à *ITMN special issue Dos Algarves* nesta data para vossa apreciação.

URL do Manuscrito: <https://www.dosalgarves.com/index.php/dosalgarves/author/submission/201>

O ficheiro submetido também segue anexo nesta mensagem.

Com os melhores cumprimentos,

Anderson Santos de Oliveira

Masters in Tourism - ESGHT, Universidade do Algarve

Tlm: 917 833 801

APPENDIX B - Proof of acceptance DAMEJ ITMN Special Issue

Accepted – May 7, 2020

30/09/2020

Gmail - Your manuscript with linguistic review



Anderson S. Oliveira <anderson.sp655@gmail.com>

Your manuscript with linguistic review

Revista Dos Algarves <dosalgarves@ualg.pt>

7 de maio de 2020 às 10:35

Para: ANDERSON SANTOS DE OLIVEIRA <a63247@ualg.pt>, "Anderson S. Oliveira" <anderson.sp655@gmail.com>

Cc: Marisol de Brito Correia <mcorreia@ualg.pt>, Ana Isabel da Silva Aço Renda <arenda@ualg.pt>

Dear Anderson,

Thank you for resubmitting your manuscript. We are delighted to inform you that it has now been accepted for publication, and has passed into the final stages of editing.

Although the article is extremely well written in English, I have detected a few minor things that needed revising. You can check what I have done in the attached copy. Please let me know if there is anything you feel should not be altered as I have suggested.


I would like to point out a couple of things that need changing because of the journal guidelines:

- 1) British English spelling (I have already made these changes)
- 2) Use of & when inside parentheses (I have already made these changes)
- 3) Use of et al. - DAMEJ guidelines require that up to 5 authors should all be named at the first mention, with et al. reserved for subsequent mentions and all mentions of articles with 6 or more authors. Please could you check all your 'et al.' references and change accordingly. Please do this on the attached copy, by Monday 11th May.

Once this language review has been completed, your article will go to the final formatting stage. You will be able to see and check the final copy before publication.

Thank you once again for your contribution.

Best wishes,
Kate

 201-441-2-SM_Revised_with language review.docx
996K

APPENDIX C – Publication Notice DAMEJ ITMN Special Issue



Anderson S. Oliveira <anderson.sp655@gmail.com>

Publication of DAMEJ Vol.36 Special Issue ITMN

Revista Dos Algarves <dosalgarves@ualg.pt>
Para: Revista Dos Algarves <dosalgarves@ualg.pt>

28 de maio de 2020 às 13:40

Dear authors,

It is with great pleasure that we can tell you that your article has now been published as part of our Special ITMN issue.

You can access the publication here:

<https://www.dosalgarves.com/index.php/dosalgarves/issue/view/29>

By clicking on the cover page, you will see a list of all the articles included in the issue, and from there you can access and download Pdf copies of the articles.

As our journal is open access, please feel free to share the link as widely as possible.

Over the next few days, we will be uploading the DOIs to the indexing sites that we are associated with.

We would like to thank you once again for your excellent contributions and we hope that you found the process of publishing through our journal to be worthwhile.

Best wishes,

Kate Torkington & Rita Baleiro
(Editors)

APPENDIX D - Proof of submission – XI Postgraduate Conference

Submitted – March 20, 2020

30/09/2020

Gmail - XI Postgraduate Conference ESGHT/ISCAL 2020 - abstract submission form



Anderson S. Oliveira <anderson.sp655@gmail.com>

XI Postgraduate Conference ESGHT/ISCAL 2020 - abstract submission form

Postgraduate Conference 2020 <notifications@cognitofrms.com>

20 de março de 2020 às 22:30

Responder a: pgconference2020@ualg.pt

Para: anderson.sp655@gmail.com

Postgraduate Conference 2020

XI Postgraduate Conference ESGHT/ISCAL 2020 - abstract submission
form

Thank your for your submission.

The organizing committee of the XI Postgraduate Conference 2020.

Você está recebendo este e-mail porque você completou uma transação com Postgraduate Conference 2020.



APPENDIX E - Proof of acceptance – XI Postgraduate Conference

Accepted – June 3, 2020

30/09/2020

Gmail - ID 17 Notificação



Anderson S. Oliveira <anderson.sp655@gmail.com>

ID 17 Notificação

Postgraduate Conference 2020 <pgconference2020@ualg.pt>
Para: "Anderson S. Oliveira" <anderson.sp655@gmail.com>

3 de junho de 2020 às 11:50

Caro Anderson,

Agradeço o envio do resumo alterado e da resposta detalhada sobre as alterações. A partir deste momento, poderá proceder ao pagamento e inscrever-se na conferência através da ligação <http://www.esght.ualg.pt/pgconference/pt/inscricoes.html> quando considerar oportuno. Aproveito para recordar que a comissão organizadora decidiu desenvolver a conferência este ano em formato apenas online. Iremos manter os nossos conferencistas informados ao longo dos próximos meses.

Melhores cumprimentos,
Pela comissão organizadora

Filipa Perdigão

APPENDIX F – Conference Program – XI Postgraduate Conference



CONFERENCE PROGRAMME

online

2 OCTOBER 2020

Almoço / Lunch				
12:50-14:00	Sala 85	Sala 86	Sala 87	Sala 89
14:00-14:45	Sessão plenária 2: Clotilde Palma, Instituto Superior de Contabilidade e Administração de Lisboa, Portugal. Moderador: Jorge Rodrigues			
14:45-16:05	Sessão plenária 8 ICT Moderador: Marisol Correia	Sessão plenária 9 HOTELARIA E TURISMO Moderador: Ana Renda	Sessão plenária 10 CIÊNCIAS ECONÓMICAS E EMPRESARIAIS Moderador: Pedro Pinheiro	Sessão plenária 11 ETHICAL, EMOTIONAL AND SUBJECTIVE ISSUES IN TOURISM (SIMPOSIUM) Moderador: M.ª Luíza Baptista
14:45-15:05	GESTÃO INTEGRADA DE PESSOA SEM ABRIGO – DIMENSÕES DA SUSTENTABILIDADE E AS TIC Leonilde Reis/ Clara Silveira / Luísa Cagica Carvalho / Carlos Mata (#26)	A INFLUÊNCIA DA LIDERANÇA NAS OPERAÇÕES DE FRONT-OFFICE NOS HOTEIS DE 5 ESTRELAS EM PORTUGAL José Fernandes (#38)	RETENÇÃO DE CLIENTES NO SETOR SEGURADOR: DETERMINANTES POSITIVOS E NEGATIVOS Manuel Leiria / Efigénio Rebelo / Nelson Matos (#25)	REPUXO DO TURISMO EM PRAIAS: O CASO DE TORRES, RIO GRANDE DO SUL, BRASIL Jennifer Bauer Eme / Maria Luíza Baptista (#16)
15:05-15:25	AGILE PROJECT AND PORTFOLIO MANAGEMENT: A SYSTEMATIC LITERATURE REVIEW Frederico Cipriano Batista / Leandro Ferreira Pereira / Renato Lopes da Costa (#52)	EL PAPEL DE LOS SISTEMAS DE INFORMACIÓN GEOGRÁFICA (SIG) EN EL DESARROLLO DEL TURISMO ENOLÓGICO. UNA APROXIMACIÓN Francisca Vázquez Palmero (#23)	EFFECT OF ORGANIZATIONAL CULTURE ON ORGANIZATIONAL PERFORMANCE – THE CASE OF SECURITY SECTOR André Rodrigues / Leandro Pereira / Renato Costa / Luís Martins/ Rui Gonçalves (#54)	AMOROSIDADE E RESPONSABILIDADE ECOSISTÉMICA NA CAMINHADA NOTURNA DE CRIÚVA (RS/BRASIL) Camila Melo / Maria Luíza Baptista (#18)
15:25-15:45	ONLINE REVIEWS, HOTEL PERFORMANCE AND MANAGEMENT IMPROVEMENT: A SYSTEMATIC LITERATURE REVIEW Anderson Oliveira / Ana Renda / Marisol B. Correia (#17)	A DISPOSIÇÃO A PAGAR DOS VISITANTES DA PRAIA DA ALBUFEIRA DO AZIBO: APLICAÇÃO DE UM MODELO HEDÔNICO Mário Almendra / Cláudia S. Costa / Eduardo Pinheiro (#48)	XERS VS. MILLENNIALS: UM OLHAR GERACIONAL SOBRE RESPONSABILIDADE SOCIAL DAS ORGANIZAÇÕES, ATRATIVIDADE ORGANIZACIONAL E INTENÇÃO DE CANDIDATURA A UMA OFERTA DE EMPREGO Luís Simões / Ana Patricia Duarte (#51)	CORPO, COMUNICAÇÃO E TURISMO: PROPOSIÇÕES PARA AMOROSIDADE E AUTOPOIESE, CONSIDERANDO O AVESSO DO TURISMO NA CIDADE DE SÃO LUÍZ GONZAGA, RIO GRANDE DO SUL, BRASIL Newton Fernandes de Ávila / Maria Luíza Baptista (#33)
15:45-16:05	O ESTADO DA ARTE EM PORTUGAL DOS SISTEMAS DE BICICLETAS PARTILHADAS (SBP): MECANISMOS DE COMUNICAÇÃO José Elias Ramalho / Manuel José Damásio / Célia Quico (#47)	A COMUNICAÇÃO ONLINE DE RSE NAS PME EXCELÊNCIA, NA ÁREA DO TURISMO – UM ESTUDO NAS EMPRESAS DO DISTRITO DE LEIRIA Francisco Delgado Ferraz (#04)	PREVISÃO DE FALÊNCIA E PERFORMANCE: A INFLUÊNCIA DA CERTIFICAÇÃO DE QUALIDADE NAS PMES PORTUGUESES Cândido Peres / Mário Antão / Pedro Pinheiro / Domingos Cristóvão (#56)	"COMUNICAÇÃO, AMOROSIDADE E AUTOPOIESE: SINALIZADORES PARA O TURISMO ENFRENTAR O FIM DO MUNDO" Maria Luíza Baptista (#06)

Última atualização: 20.09.2020 (PP & SR)

APPENDIX G - Proof of submission – Tourism and Hospitality Research (THR)

Submitted – September 24, 2020

Manuscript ID: THR-20-0234

Status: Under Analysis (September 30, 2020)

30/09/2020

Gmail - Tourism and Hospitality Research THR-20-0234



Anderson S. Oliveira <anderson.sp655@gmail.com>

Tourism and Hospitality Research THR-20-0234

Tourism and Hospitality Research <onbehalf@manuscriptcentral.com>

24 de setembro de 2020 às 23:18

Responder a: merz.hoare@gmail.com

Para: anderson.sp655@gmail.com, arenda@ualg.pt, mcorreia@ualg.pt, nantonio@novaims.unl.pt

24-Sep-2020

Dear Mr. Oliveira:

Your manuscript entitled "Hotel customer segmentation and sentiment analysis through online reviews: an analysis of selected European markets" has been successfully submitted online and is presently being given full consideration for publication in Tourism and Hospitality Research.

Your manuscript ID is THR-20-0234.

You have listed the following individuals as authors of this manuscript:

Oliveira, Anderson; Renda, Ana; Correia, Marisol; Antonio, Nuno

Please mention the above manuscript ID in all future correspondence or when calling the office for questions. If there are any changes in your street address or e-mail address, please log in to ScholarOne Manuscripts at <https://mc.manuscriptcentral.com/thr> and edit your user information as appropriate.

You can also view the status of your manuscript at any time by checking your Author Center after logging in to <https://mc.manuscriptcentral.com/thr>.

As part of our commitment to ensuring an ethical, transparent and fair peer review process SAGE is a supporting member of ORCID, the Open Researcher and Contributor ID (<https://orcid.org/>). We encourage all authors and co-authors to use ORCID iDs during the peer review process. If you have not already logged in to your account on this journal's ScholarOne Manuscripts submission site in order to update your account information and provide your ORCID identifier, we recommend that you do so at this time by logging in and editing your account information. In the event that your manuscript is accepted, only ORCID iDs validated within your account prior to acceptance will be considered for publication alongside your name in the published paper as we cannot add ORCID iDs during the Production steps. If you do not already have an ORCID iD you may login to your ScholarOne account to create your unique identifier and automatically add it to your profile.

Thank you for submitting your manuscript to Tourism and Hospitality Research.

Sincerely,

Mercedita Hoare

Tourism and Hospitality Research

merz.hoare@gmail.com

APPENDIX H - Proof of submission – ITC'20

Submitted – September 22, 2020



Anderson S. Oliveira <anderson.sp655@gmail.com>

ITC'20 Abstract Submission - Hotel customer segmentation and sentiment analysis through online reviews: an analysis of selected European markets

Anderson S. Oliveira <anderson.sp655@gmail.com>

22 de setembro de 2020 às 22:48

Para: itc.eventos@ipleiria.pt

Cc: ANDERSON SANTOS DE OLIVEIRA <a63247@ualg.pt>, Ana Isabel da Silva Aço Renda <arenda@ualg.pt>, Marisol de Brito Correia <mcorreia@ualg.pt>

Dear ITC'20 Commission Members,

Please find attached the abstract of the paper entitled *Hotel customer segmentation and sentiment analysis through online reviews: an analysis of selected European markets*.

Corresponding author's contact details:

Name: Anderson Santos de Oliveira

Filiation: School of Management, Hospitality and Tourism (ESGHT), Universidade do Algarve, Portugal

Phone: +351 917 833 801

In case of any further questions, please do not hesitate to contact me.

Sincerely,

Anderson Oliveira

Phone: 917 833 801

<https://www.linkedin.com/in/anderson-s-oliveira/>

 **Abstract_ITC20_Hotel_Cust_Seg.docx**
22K

APPENDIX I – Letter of acceptance – ITC'20

Accepted – September 23, 2020



ACCEPTANCE LETTER

Dear authors,

Anderson S. Oliveira, *ESGHT, Universidade do Algarve, Portugal*

Ana I. Renda, *CiTUR, ESGHT, Universidade do Algarve, Portugal*

Marisol B. Correia, *CiTUR, ESGHT, Universidade do Algarve, Portugal*

Nuno Antonio, *NOVA IMS, Universidade NOVA de Lisboa*

It is our pleasure to inform you that your abstract entitled:

[A3520] "Hotel customer segmentation and sentiment analysis through online reviews: an analysis of selected European markets",

has been accepted for presentation at the *XII International Tourism Congress 2020*, which will be held, as a VIRTUAL event, on 27-28 October 2020. The conference is organized by the Centre for Tourism Research, Development and Innovation (CiTUR), in partnership with University Feevale (Brazil).

Looking forward to your participation,

This block contains a handwritten signature in blue ink that reads 'JPJ' followed by the word 'CiTUR.' in a stylized font. To the right of the signature is a small, circular logo consisting of concentric blue lines, which is part of the CiTUR branding.

João Paulo Jorge, PhD

Organizing Committee of XII International Tourism Congress

September 23, 2020

APPENDIX J - Proof of submission – ITC'20

Submitted – October 7, 2020

07/10/2020

Gmail - RES: ABSTRACT SUBMISSION -



Anderson S. Oliveira <anderson.sp655@gmail.com>

RES: ABSTRACT SUBMISSION -

t-Forum 2020 <tforum2020@ualg.pt>

7 de outubro de 2020 às 10:03

Para: "anderson.sp655@gmail.com" <anderson.sp655@gmail.com>

Dear Anderson Oliveira,

Thank you for choosing to submit your work to the t-Forum 2020 conference.

We acknowledge receipt of your abstract. Please note that your **abstract ID** is **235**.

We kindly request you to provide us with your abstract ID for further communications.

Kindly note, that the corresponding author will be notified of abstract acceptance as soon as possible.

Best regards,

On behalf of the Organizing Committee,

—

Secretariat

t-Forum 2020 Global Conference

www.tforum2020.org



Author Guidelines

- 1) The cover page must contain: the title in the language of the article (English, Portuguese or Spanish), followed by the title in English (if the article is written in Portuguese or Spanish); author names, exactly as they are to appear in the published version; institutional affiliation(s) and full postal addresses; author emails; indication of corresponding author; ORCID IDs (if available).
- 2) The first page should contain only: the title of the article; abstract (max. 150 words); key words (max. 6, in Portuguese or Spanish and in English).
- 3) The manuscript should be written in 11pt Candara font with 1.5 line spacing.
- 4) Full articles should not exceed 7000 words, including notes, references, tables and figures; research reports should not exceed 3500 words; critical literature reviews should not exceed 2500 words.
- 5) All sections should be given a heading, and if numbered, to a maximum of two sub-levels (e.g. 1.1; 1.1.1).
- 6) For direct citations in the text use double citation marks ("...") and include page numbers.
- 7) Please use footnotes (not endnotes) which should be written in 9pt Candara. Please use footnotes sparingly. Footnotes should not contain full references; full references should be placed in the references section at the end of the article.
- 8) Any figures and/or tables should be presented in the body of the article, in editable format. The author is strictly responsible for obtaining any necessary rights of reproduction. The journal is not liable for the usage of any unauthorized images.

Important:

- The review process is blind and the main manuscript file must not contain any personal/academic information about the author. Self-references that could identify the author should be presented as XXXX, date (e.g. XXXX, 2015) in both the main body and in the references list. The full references will be reinserted once the review process has finished.
- Authors must fill in the academic data in the form for the submission of manuscripts.
- Every source mentioned or quoted within the text must be included in the final reference list of the article.
- No material must be present in the reference list unless it is directly mentioned and/or quoted within the article.
- The journal will not be held responsible for the concepts, ideas or opinions of submitting authors.
- Authors with an ORCID ID should include it in the cover page. Learn more at <http://www.orcid.org>.

ANNEXE 2 – Tourism and Hospitality Research (THR) - Author Guidelines

Tourism and Hospitality Research covers applied research in the context of Tourism and Hospitality in areas such as policy, planning, performance, development, management, strategy, operations, marketing and consumer behavior. We accept papers in other areas within the context of tourism and hospitality provided the paper delivers research with significant implications for tourism and hospitality. Please note that for hospitality papers we expect a subsection in the conclusions of your paper clearly labeled as Industry Implications. Each issue of ***Tourism and Hospitality Research*** publishes: detailed, authoritative applied research papers from researchers and practitioners worldwide. We also accept:

Original Manuscripts (6,000 – 8,000 words)

An original manuscript furthers understanding of tourism and hospitality by reporting on research that is innovative, previously unpublished and not being considered for publication elsewhere. An original manuscript needs to make a valuable contribution to knowledge, policy or practice in tourism and hospitality by drawing upon sound findings, based on robust data, collected via academically rigorous methods. It should include a rationale justifying the need for the study to be conducted, a critical review of the literature underpinning the research aim, a solid elaboration of the methods used and a deep conceptualisation of results in light of the literature reviewed. Conclusions should offer suggestions for future research and if relevant, management implications.

Preparing your manuscript

Formatting your article

When formatting your references, please ensure you check the reference style followed by your chosen journal. Here are quick links to the [SAGE Harvard](#) reference style, the [SAGE Vancouver](#) reference style and the [APA](#) reference style.

Other styles available for certain journals are: [ACS Style Guide](#) [↗](#), [AMA Manual of Style](#), [ASA Style Guide](#) [↗](#), [Chicago Manual of Style](#) [↗](#) and [CSE Manual for Authors, Editors, and Societies](#) [↗](#).

Please refer to [your journal's manuscript submission guidelines](#) to confirm which reference style it conforms to and for other specific requirements.

Equations should to be submitted using Office Math ML and Math type.

Microsoft Word guidelines

There is no need to follow a specific template when submitting your manuscript in Word. However, please ensure your heading levels are clear, and the sections clearly defined.