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Creating perceptual maps in the hospitality sector using eWOMs: an application to hotels in Tiradentes-MG

Criação de mapas de percepção no sector da hotelaria utilizando eWOMs: uma aplicação em Hotéis de Tiradentes/MG

Creación de mapas de perceptivos en el sector de la hostelería utilizando eWOMs: una aplicación a los hoteles de Tiradentes-MG

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Abstract: Effective positioning is critical when it comes to achieving business success. One helpful method for understanding customer perceptions of service attributes is perceptual mapping. The Internet has significantly impacted the hospitality industry, and customer reviews have emerged as a popular source of information. This paper explores the use of electronic word-of-mouth (eWOM) to create perceptual maps in the hospitality industry. It presents a strategy involving gathering and analyzing eWOMs using web scraping and text mining tools to build perceptual maps. This strategy has been applied to eWOMs for customers from ten hotels in Tirantes/MG, which were extracted from the Booking.com platform. The maps worked on three key dimensions that influence the perception of hotel services analyzed: Quality and Service (amenities, comfort, cleanliness), Guest Preferences (room types, customer groups), and Economic Factors (price, value for money, staff performance). Hotels that excel in these areas have aligned with the diverse needs of guests and market segments, indicating a strategic positioning in service quality and customer satisfaction. The study encourages using eWOMs as they provide strategic options beyond simple descriptive analysis for hotel managers. The findings of this study can help managers understand their customers' perceptions of their services compared to those of their competitors. This can allow managers to make future-directed strategic decisions to improve targeted areas.

Keywords: EWOM, customer perceptual mapping, online reputation management, positioning, booking.com.

Resumo: O posicionamento efetivo é fundamental para alcançar o sucesso empresarial. Um método útil para compreender as percepções dos clientes sobre os atributos do serviço é o mapeamento perceptual. A Internet teve um impacto significativo no sector da hotelaria e as opiniões dos clientes surgiram como uma fonte de informação popular. Este documento explora a utilização do boca-a-boca eletrônico (eWOM) para criar mapas de percepção na indústria hoteleira. Apresenta uma estratégia que envolve a recolha e análise do eWOM utilizando ferramentas de coleta de dados da Web e de extração de texto para criar mapas de percepção. Essa estratégia foi aplicada aos eWOMs de clientes de dez hotéis de Tirantes/MG, extraídos da plataforma Booking.com. Os mapas trabalharam três dimensões-chave que influenciam a percepção de serviços hoteleiros analisados: Qualidade e Serviço (comodidades, conforto, limpeza), Preferências dos Hóspedes (tipos de quartos, grupos de clientes) e Fatores Econômicos (preço, relação custo-benefício, desempenho da equipe). Hotéis que se destacam nessas áreas demonstraram alinhamento com as diversas necessidades dos hóspedes e segmentos de mercado, indicando um

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posicionamento estratégico tanto em qualidade de serviço quanto em satisfação do cliente. O estudo incentiva o uso de eWOMs, pois eles fornecem opções estratégicas além da simples análise descritiva para a gerência de hotéis. Os resultados deste estudo podem ajudar os gestores a compreenderem as percepções dos seus clientes sobre os seus serviços em comparação com os dos seus concorrentes. Isto pode permitir aos gestores tomarem decisões estratégicas orientadas para o futuro, a fim de melhorar áreas específicas.

Palavras-chave: EWOM, mapeamento de percepção de clientes, gestão de reputação online, posicionamento, booking.com.

Resumen: Un posicionamiento eficaz es fundamental para lograr el éxito empresarial. Un método útil para comprender las percepciones de los clientes sobre los atributos del servicio es la cartografía perceptual. Internet ha tenido un gran impacto en el sector de la hostelería, y las opiniones de los clientes se han convertido en una fuente de información muy popular. Este artículo explora el uso del boca a boca electrónico (eWOM) para crear mapas perceptivos en el sector de la hostelería. Presenta una estrategia de recopilación y análisis de eWOM mediante herramientas de web scraping y minería de textos para construir mapas perceptuales. Esta estrategia se ha aplicado a eWOMs de clientes de diez hoteles de Tirantes/MG, que se extrajeron de la plataforma Booking.com. Los mapas trabajaron sobre tres dimensiones clave que influyen en la percepción de los servicios hoteleros analizados: Calidad y Servicio (comodidades, confort, limpieza), Preferencias de los Huéspedes (tipos de habitaciones, grupos de clientes) y Factores Económicos (precio, relación calidad-precio, rendimiento del personal). Los hoteles que destacan en estas áreas han demostrado estar en consonancia con las diversas necesidades de los huéspedes y segmentos de mercado, lo que indica un posicionamiento estratégico tanto en calidad de servicio como en satisfacción del cliente. El estudio anima a utilizar los eWOMs, ya que proporcionan opciones estratégicas más allá del simple análisis descriptivo para los gestores hoteleros. Los resultados de este estudio pueden ayudar a los gestores a comprender las percepciones de sus clientes sobre sus servicios en comparación con los de sus competidores. Esto puede permitir a los gestores tomar decisiones estratégicas orientadas al futuro para mejorar áreas específicas.

Palabras clave: EWOM, mapas perceptivos del cliente, gestión de la reputación online, posicionamiento, booking.com.

1 Introduction

Positioning is crucial for business success. It involves creating a product image in the minds of target customers and choosing a differential advantage to compete with rivals. The goal is to create a distinctive place in the minds of potential customers (Faullant et al., 2008; Lambin, 2011).

Positioning usually requires a solid analysis of the firm's current performance and its strengths and weaknesses. Positioning or perceptual maps are useful graphical tools for understanding customers' perceptions of products, services, attributes, brands, and promotions. They help businesses gain a competitive edge by visualizing their position concerning key aspects of their marketing strategy. Thus, perceptual mapping is an essential analytical tool for businesses to understand their customers better and succeed in their respective markets (Faullant et al., 2008; Gigauri, 2019; Lovelock et al., 2022).

The perceptual Mapping method helps to display the relative positioning of brands and their benefits from the customer's standpoint. The key goal is to group similar brands or benefits and determine which benefits are most closely related. This method also helps to identify which attributes are unrelated and which features are viewed as contradictory or opposites. To determine how the various offerings are perceived in the market, the key attributes that stakeholders use to perceive products in the market need to be established (Gigauri, 2019; Lambin, 2011).

The Internet has significantly impacted the hospitality industry, benefiting consumers and hotel operators by reducing costs and providing access to real information. Internet usage has changed consumer behavior by providing them with a new world of information, including travel information, trip planning, online booking, tourism product purchases, and electronic word-of-mouth communication. As a result, travelers rely heavily on the Internet for all aspects of their travel planning (Sann et al., 2021).

Online communities such as Yelp.com and Booking.com have become popular platforms for exchanging information about service experiences. Consumers are encouraged to post photos and reviews, which leads to the foundation of online rating systems and electronic word-of-mouth (eWOM) information that can highly influence consumers in their decision-making process. Moreover, internet technologies have opened up a channel for travelers to share their experiences, opinions, or evaluations of products and services with untold numbers of people (Lee et al., 2018; Liu et al., 2018; Sann et al., 2021).

In this context, User-generated reviews (UGRs) have become increasingly popular in the hotel industry, with travel websites like TripAdvisor, Trivago, and Booking.com exhibiting exponential growth in reviews. For hoteliers, UGRs provide real-time online data that record customers' real experiences, ideas, and needs and offer opportunities for early notification of problems (Hsiao & Hsiao, 2021).

E-commerce and social media have made eWOM more powerful because it has a significant reach and is publicly available. Researchers have found that eWOM communications have several characteristics, including enhanced volume, dispersion, persistence, observability, anonymity and deception, salience of valence, and community engagement (Ismagilova et al., 2017).

Online customer reviews, also known as eWOM, are a popular source of information for consumers. Companies should manage eWOM by monitoring different online platforms, responding to communications, and using them for business (Ismagilova et al., 2017). Studies have shown that review valence (positive, negative, or neutral) can influence purchasing and booking intentions in the hospitality industry. Reviews are considered more trustworthy than traditional marketing tools and can shape the reputation of tourism enterprises (Anagnostopoulou et al., 2020).

Taking the above factors into account, using eWOM offers a valuable opportunity for the hospitality industry in Brazil. It helps businesses understand consumer opinions and improve marketing strategies with perceptual maps. Online reviews on platforms like TripAdvisor and Booking.com greatly influence booking decisions and are often considered more trustworthy than traditional marketing tools. Key features of online communication include volume, persistence, and engagement, which help spread messages and affect public opinion.

Despite the importance of eWOM in building reputation and attracting customers, more research needs to be done on tools like web scraping and text mining to collect and analyze this data systematically. This study addresses this gap by proposing a method combining eWOMs, data analysis, and perceptual map visualization. The main goal is to develop perception maps using eWOM data from Booking.com reviews of customers from hotels in Tiradentes-MG, an important tourist town. This innovative approach will help us understand how consumers see businesses on review sites.

In the field of hospitality and tourism, some studies on positioning have been carried out (Faullant et al., 2008; D. J. Kim et al., 2007; Knutson, 2000; Surovitskikh & Lubbe, 2008; Uysal et al., 2000; van Zyl, 2017). The authors of these studies have investigated the current positions of companies in relation to selected attributes and have suggested managerial and marketing implications. However, none of these studies looked at eWOM as a data source for company positioning.

Our study encourages the use of eWOMs, which provide strategic options beyond simple descriptive analysis for hotel managers. We will demonstrate how perceptual maps of customer attributes can aid managers in understanding their customers' perceptions of their services compared to their competitors. Such maps can be used as tools for making future-directed strategic decisions to improve targeted areas and achieve successful positioning.

The article begins with a review of the literature on the importance and characteristics of positioning strategy and its relationship with perception maps. It describes the main characteristics of eWOM and its role in the hospitality sector. It then describes the research methodology used, the results of the analysis of the data collected, and the positioning maps drawn. The article closes with a discussion of the results and concludes with theoretical and managerial implications.

2 Theoretical framework

2.1 Positioning strategy

A positioning strategy is essential in creating distinctive differences valued by customers. Understanding product positioning concepts is crucial to survive in today's competitive marketing environment. Well-defined positioning activities positively impact company performance. Positioning takes advantage of a specific aspect of identity at a given point in time, in a given market, and against a defined set of competitors (Gigauri, 2019; Kalafatis et al., 2000).

There are several schools of approach to positioning in literature. Urde and Koch (2014) use metaphors to characterize the schools of thought in positioning literature:

- *Positioning as a puzzle* – In this school, analyzing market segments and identifying unmet customer needs can help position a brand to fit specific demands. Using puzzle-solving methods, market patterns can be revealed to optimize product positioning and identify ideal brand characteristics.
- *Positioning as wordplay* refers to using rhetorical techniques to position a brand in the prospect's mind. The goal is to achieve a strategic advantage in an over-communicated society and cut through the advertising noise. The key to successful positioning is to linguistically define and communicate product attributes that are not price-related. Academic research suggests that a brand's position is based on the degree of similarity or difference in a given product or service category. One can emphasize its characteristics vis-a-vis competition and category levels to position the brand.
- *Positioning as chess* – In this school, strategic positioning involves performing different or similar activities in different ways from rivals. It requires diligent analysis, thorough planning, and strategic execution. To define a company's position, general management must evaluate the competitive situation and combine available resources to compete.

- *Positioning as dominoes* – For this school, brand positioning is like the game of dominoes, where matching values is key. A brand's identity and track record represent its competitive strength. To leverage brand equity and value creation, a brand's identity should match its position. Volvo (safety), Nordstrom (service), Rolex (prestige), Miele (quality), and Google (innovation) are examples of brands that do this well. Core values, brand heritage, and authenticity are essential characteristics that should be matched with the selection of an identity-based position.
- *Positioning as wild-card poker* involves creating uncontested market space by breaking established rules and navigating into untapped positions. This approach encourages companies to be unpredictable and use cultural innovation to unlock new markets. The main message is to take a creative and unconventional approach to business strategy (Urde & Koch, 2014).

Positioning is an iterative process that requires intentional and proactive steps. It involves making conceptual, strategic, and operational decisions and should be based on the considerations of the company, its competitors, and its target market/customers (Kalafatis et al., 2000).

The strategy of positioning helps service managers analyze their firm's offerings and involves answering some key questions, including identifying the firm's current standing in the minds of customers, determining the target audience, assessing the value proposition of each service offering, analyzing competitors, evaluating customer satisfaction, and identifying areas for improvement (Lovelock et al., 2022).

Certainly, as explained above, the positioning of a service company is not restricted to the use of perception maps. It stems from an active and interactive process of business planning and control. However, this paper focuses on the construction of this tool.

2.2 Perceptual maps

Diverse marketing channels influence customer perception. Perceptual maps help in new product design, advertising, retail location, and other marketing applications by showing the relative positioning of a product in the market (Gigauri, 2019).

Perceptual mapping, also known as positioning map, is a technique used to graphically represent the space of competitive offerings. It helps develop a market-positioning strategy for products and services by understanding the complex relationships among competitors and the criteria buyers use in making purchase decisions. They are great tools to visualize competitive positioning along key aspects of a service's marketing strategy and to develop scenarios of potential competitor responses (Gigauri, 2019; Lovelock et al., 2022).

Products and services have multiple physical and intangible attributes, with various consequences for the purchaser. Marketers must decide how many attributes to build into the product, how much quality to include in each attribute, and how to put the attributes together to gain a competitive advantage. However, only a few attributes are important in any choice process, and these key attributes vary by market segment. A perceptual map can be used to visually illustrate consumer perceptions and prioritize brands and their perceived attributes. The closer products are clustered together on the map, the greater the competition, while the farther apart they are, the greater the opportunity to enter the market (Gigauri, 2019; Lambin, 2011).

Perceptual mapping is a powerful tool for examining product position. It helps understand strengths, weaknesses, and similarities between products, repositioning, tracking buyer perception, and measuring the effectiveness of marketing actions (Lambin, 2011).

A perceptual map is obtained through a variety of techniques, including principal component analysis (PCA), (multiple) correspondence analysis, factor analysis, and multidimensional scaling (MDS) (Gower et al., 2010). There are two methods of developing perceptual maps: compositional and decompositional. Perceptual mapping is exploratory in nature and is used to gain insights without testing a hypothesis in statistical terms (Gigauri, 2019).

2.3 eWOM and the Hospitality Sector

eWOM is an ongoing information exchange process between consumers regarding products or services available on the Internet. It occurs through different settings such as blogs, social networking sites, discussion forums, and review websites. The anonymity of the Internet allows consumers to give and seek opinions about product or service experiences (Ismagilova et al., 2017; Yuan et al., 2022)

eWOM communication is different from traditional WOM in many ways. eWOM can reach a wider audience, occurs in a computer-mediated environment, and involves weaker ties between strangers. Reviews in eWOM are often anonymous, conversations are more visible, and eWOM is more measurable and voluminous than traditional WOM (Ismagilova et al., 2017; Vo et al., 2022).

The Internet has transformed hospitality marketing and distribution. New communication methods and technology have changed consumer behavior, leading to a shift in focus for hotels and other companies in the industry (Serra Cantallops & Salvi, 2014).

Online customer reviews are considered to be more effective in influencing consumer behavior than traditional marketing tools. Reviews are perceived as more trustworthy and credible as they are independent of marketers' selling efforts. Online reviews are important sources of information that can shape the reputation of tourism enterprises. With the increasing reliance on the internet as a source of information, eWOM is expected to remain an important channel for facilitating information among customers, hotel practitioners, and online seekers (Anagnostopoulou et al., 2020; Sann et al., 2021).

The consumers' purchase decision process for hotels is influenced by various factors such as location, brand name, facilities, service quality, price, loyalty program, quality ratings, and word-of-mouth. Word-of-mouth is a significant factor affecting consumers' choice of products and services. Positive and negative reviews impact consumer awareness, attitudes, and hotel booking intentions. Social media has become a crucial marketing tool for the hospitality industry, and millennials are the most populous generation globally, and their purchasing decisions are significantly influenced by social media content (Ali Taha et al., 2021; Anagnostopoulou et al., 2020; Serra Cantallops & Salvi, 2014).

3 Methodology

The focus of this section is mainly to demonstrate the methodological application of Perceptual or positioning mapping, how it was developed, and how it can be used in the Brazilian Hotel Industry Context. This study is the result of a research project exploring the possibilities of eWOM to improve the quality of services in the hospitality sector.

3.1 Sample

The sample of eWOMs chosen for analysis consisted of ten existing hotels in the city of

Tiradentes-MG on the Booking.com platform. This study examines self-owned independent hotels instead of chain hotels linked with a brand or consortium.

The authors chose Booking.com because it only invites reviews from people who have made a reservation and paid through the site, which prevents fake reviews. That is why it is considered more reliable than Tripadvisor.com (Anagnostopoulou et al., 2020).

This research focuses on extracting consumer preferences through web scraping and text mining of online reviews (Aydin, 2018; Han & Anderson, 2021). It aims to identify hotel attributes that are highly associated with customer satisfaction.

3.2 Proposed stages for the construction of perceptual mapping

Constructing a perceptual or positioning map for a group of hotels using electronic word-of-mouth (eWOM) information from the Booking.com platform involves specific steps. Here are the main steps in this context:

Selection of the region and the hotels or hotels to be evaluated.

- Data Collection and Extraction: Gather reviews, ratings, and comments from Booking.com for hotels using web scraping tools.
- Data Preprocessing: This involves cleaning and standardizing the format of extracted data. This also involves addressing missing values and irrelevant information. Consider converting ratings to a common scale.
- Exploratory Data Analysis (EDA) of customer reviews: Generate descriptive stats for the dataset: mean and median ratings, distribution of ratings, and number of reviews per hotel. This gives an overview of the data.
- Multivariate data analysis using Multidimensional Scaling (MDS) and Principal Component Analysis (PCA).
- Positioning Map Visualization: Use the results of MDS and PCA to generate a positioning map.
- Interpretation and Analysis: Analyze the positioning maps to identify clusters of hotels with similar attributes. Understand the relationships between different factors and gain insights to inform marketing strategies and improvements in hostel services.

4 Results

4.1 Data Collection, Extraction and Preprocessing

The public and private sectors have implemented several initiatives, including restoring and revitalizing the streets and mansions. These investments transformed Tiradentes into one of Minas Gerais's most popular tourist attractions. As a result, there has been a surge in investments in hotels and restaurants in the city (Bolson et al., 2006). Considering the city's status as a tourist center, the authors chose ten hotels in this area from Booking.com.

Automated data extraction from the internet through a computer program is what web scraping refers to. With the rise of open-source web scraping tools, researchers can now easily develop customized web scrapers, which can help them download, parse, and organize data from the internet (Han & Anderson, 2021).

We analyzed the data using various R packages (R Core Team, 2022) such as RSelenium (Harrison, 2022), tidyverse (Wickham et al., 2019), sys (Ooms, 2023), httr (Wickham, 2022a), rvest (Wickham, 2022b), car, openxlsx (Schauberger & Walker, 2023), rebus (Cotton, 2017), and lubridate (Grolemund & Wickham, 2011). In addition, we used FactoMineR (Lê et al., 2008), ggplot2 (Wickham, 2016), magrittr (Bache & Wickham, 2022), and ggpubr (Kassambara, 2023) to perform K-means clustering, Multidimensional Scaling, and PCA analyses, as well as to create perceptual maps.

We pre-processed the data in the R environment using web scraping packages such as RSelenium (Harrison, 2022), httr (Wickham, 2022a) and rvest (Wickham, 2022b). These packages facilitated the collection of guest review information through the URLs of review pages. The `GET` function was employed to send HTTP requests to the URLs, simulating a browser using a custom header. From the responses received from the pages, data was extracted, including customer reviews containing positive and negative comments, overall rating given to the stay, date of stay, type of suite used, type of traveler (Group of friends, Couple, Family with Children, Group Individual), length of stay, title of the rating given by the customer, and general information about the hostel such as overall rating on Price, Cleanliness, Comfort, Location, Amenities, Employees, and Value for Money. The collected data was then organized and grouped into various datasets.

4.2 Proposed stages for the construction of perceptual mapping Exploratory Data Analysis

Some analysis was conducted on the data collected regarding the profiles of the clients who evaluated the hotels as it is shown in Table 1. Couples and families with kids are the majority in the hotels. It is worth noting that various studies have highlighted differences in expectations, preferences, and values among different customer groups. For instance, couples tend to be more easily satisfied with service quality attributes when compared to family and friend segments. On the other hand, the family group places a higher value on leisure activities and services that support their children and overall family than the couple and friend group (Kalnaovakul & Promsivapallop, 2023).

Table 1 – Profiles – percentage by group of customers

Hostel	Group of friends	Couple	Family with kids	Group	Individual traveler
1	5.5	58.9	23.2	11.0	1.4
2	3.7	55.4	31.5	8.1	1.3
3	6.0	60.4	26.3	6.0	1.3
4	3.4	66.2	26.4	2.3	1.7
5	4.7	68.9	16.2	6.8	3.4
6	4.6	45.7	39.9	6.2	3.6
7	5.6	27.4	61.3	4.8	0.9
8	2.9	81.6	8.0	5.8	1.7
9	4.5	74.2	13.6	4.8	2.9
10	5.7	56.1	32.5	4.1	1.6

Source: research data (2024).

It is important to determine which hotels have statistically different average ratings, as many have similar average ratings. Therefore, some statistical analyses were made to identify differences between average scores of customer ratings according to Table 2.

Table 2 – Statistics of Customer Rating by Hotel

Hotel	Average Rating	Standard Deviation	Interquartile range	Sample size
1	9.8	0.385	1	73
2	8.9	1.213	2	298
3	8.7	1.418	3	149
4	9.0	1.096	2	174
5	8.9	1.568	3	148
6	8.9	1.353	3	499
7	9.2	1.300	2	124
8	9.3	0.862	2	174
9	9.2	1.051	2	374
10	9.2	1.367	2	123

Source: research data (2024).

4.3 Positioning Map visualization and interpretation

Booking.com offers a wide range of hotel information, including quality dimensions reported and referenced in the literature. Knowing and understanding the quality of service is important for hotel businesses, as it enables hotel managers to enhance their services and improve their overall business performance.

Various factors influence customer satisfaction and dissatisfaction in hotels. The factors that make customers satisfied could also cause dissatisfaction if there are problems with delivery (Kalnaovakul & Promsivapallop, 2023).

A referenced model on the dimensions of quality in hotels is HOLSERV Plus. This model includes five dimensions and their attributes: Room (equipment, services, cleanliness), Facilities (breakfast, restaurants, pool, fitness/spa facilities), Surroundings (location, proximity to amenities), Employees (appearance, behavior, promptness), and Reliability (willingness to help guests, handle requests and complaints) (Boon et al., 2013).

Below are some of the dimensions proposed in the model HOLSERV Plus and others present in the data collected by Booking.com that was used to construct the perception map.

- Cleanliness – Customers expect a clean and comfortable atmosphere with appropriate equipment for their stay. The surrounding environment also plays a crucial role in creating a great customer impression. A clean hotel with a tranquil environment provides customers with a comfortable place to rest and relax (Nicholas & Lee, 2017).

- Comfort – This dimension should be present mainly in the guest room. A high-quality room that is clean, spacious, and comfortable with practical and convenient furniture and facilities can compensate for the absence of other services. In contrast, a poor-quality room can give customers an unsatisfactory experience that cannot be remedied (Hsiao & Hsiao, 2021; Kalnaovakul & Promsivapallop, 2023).
- Location – Present in the surroundings dimension at the model HOLSERV, it refers to the hotel's location and proximity to amenities, public transport, and attractions (Boon et al., 2013).
- Facilities – the amenities and provisions found in a hotel, such as breakfast, dining options, bars, swimming pools, and fitness and spa facilities (Boon et al., 2013).
- Staff – The willingness of staff to help guests in specific situations and handle requests and complaints is crucial for customer satisfaction. Staff attentiveness, professionalism, and responsiveness are significant factors that contribute to hotel customer satisfaction. The whole process of staff recruitment, training, and motivation must be considered to maintain a high-quality service attitude (Kalnaovakul & Promsivapallop, 2023).
- Value for money – It is a critical attribute with a positive relationship to revisit. Value for money is part of the sacrifices made by the customer (Rondan-Cataluña & Rosa-Diaz, 2014).
- Types of Rooms – Some hotels offer a variety of rooms to their guests. The number of room types a hotel has is an important variable because it allows hotels to cater to different groups of customers in a more personalized way. Customers are particularly concerned with the room atmosphere and facilities provided by the Hotel (Hsiao & Hsiao, 2021).
- Customer groups – This particular dimension pertains to the different types of customer groups. Each customer group has its own unique set of requirements for management strategies, which are essential in providing top-notch service quality (Boon-itt & Rompho, 2012). The analysis focused on the Couple and Family with Kids groups, as they are more representative of the hotels being studied.

- Average rating and its range – The Hotel's average scores and interquartile range are used to construct the map, and customer ratings are crucial in selecting a hotel (Mellinas & Martin-Fuentes, 2021).
- Price is an important factor in how customers assess the quality of service they expect to receive at a hotel (Dabestani et al., 2016). Some studies suggest that the cost of a room, or the amount a customer is willing to pay, is influenced by various factors that represent the quality of different aspects of the hotel (Zhang et al., 2011). In general, guests prioritize quality over price when comparing services. As a result, hotels should strive to maintain a certain level of quality that satisfies the customers' needs and demonstrate this quality in their operations (Ali et al., 2021).

The information collected from Booking.com was processed and grouped by hotel according to Table 3.

Table 3 – Data used to construct the perception maps.

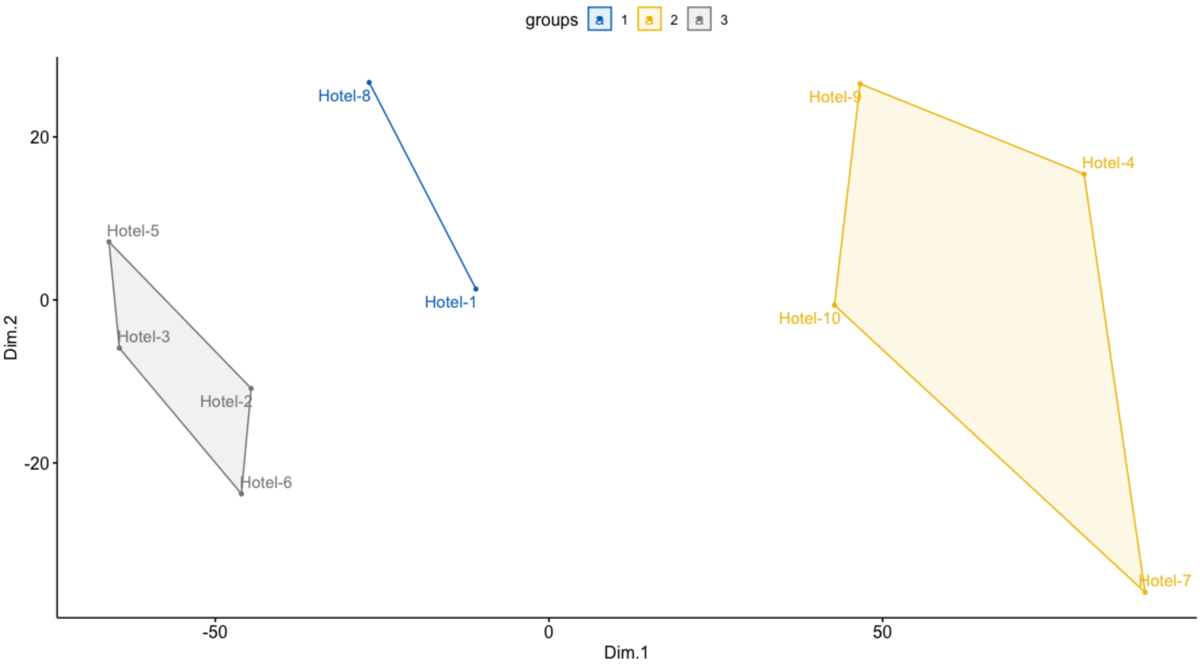
Hotel	Price	Cleanliness	Comfort	Location	Amenities	Staff	Value for Money	Types of Rooms	% Family & kids	Average Rating	Interquartile Range	% Couple
Hotel-1	368	9.8	9.6	8.6	9.6	9.8	9.5	3	23.29	9.82	1	58.90
Hotel-2	333	8.9	8.8	9.9	8.6	9.3	8.5	5	31.54	8.91	2	55.37
Hotel-3	314	9	8.7	9.5	8.6	9.4	8.9	4	26.17	8.66	3	60.40
Hotel-4	460	9	9.2	7.9	9.1	9.2	8.5	6	26.44	9.02	2	66.09
Hotel-5	314	9	8.9	7.9	8.9	9.6	9.2	6	16.22	8.94	3	68.92
Hotel-6	330	9	8.8	9.5	8.5	9.3	8.9	6	39.88	8.88	3	45.69
Hotel-7	463	9.4	9.1	8.3	9.3	9.7	9.2	4	61.29	9.20	2	27.42
Hotel-8	355	9.3	9.3	9.3	9.2	9.4	8.6	6	8.05	9.30	2	81.61
Hotel-9	428	9.2	9.1	9.2	8.9	9.7	8.7	12	13.64	9.19	2	74.06
Hotel-10	421	9.1	9.1	8	9	8.6	8.9	4	32.52	9.18	2	56.10

Source: research data (2024).

We used the Multidimensional Scaling (MDS) technique to reduce the dimensionality of data while preserving pairwise distances between observations based on Euclidean distances. The technique transforms a set of distances between objects into a lower-dimensional representation for visualization purposes. MDS represents perceived similarities among stimuli by arranging similar stimuli in spatial proximity to one another. At the same time, disparate stimuli are represented far apart (Bagozzi et al., 1998; Sheldon Zedeck et al., 2014).

We also used the k-means clustering algorithm, which partitions a dataset into K clusters based on similarity. K is a user-defined parameter. Moreover, the algorithm assigns data points to clusters by minimizing the variance within each cluster. The algorithm is a type of cluster analysis that separates a large set of entities into a smaller number of k subsets (i.e… clusters) by assigning each entity to the subset closest to the mean value (Sheldon Zedeck et al.. 2014). Based on the guidelines for producing perceptual maps. The authors used the K-means clustering and Multidimensional Scaling, as we can see in Figure 1, to differentiate groups of Hotels (Afifi et al., 2020; Gower et al., 2010).

Figure 1 – Perception map **using** MDS and K-means clustering algorithm.



Source: research data (2024).

Figure 1 presents a perception map that clearly distinguishes the positioning of the ten hotels analyzed. The map shows three groups of hotels. In the first cluster (Group 1), Hotel-1 and Hotel-8 are situated relatively close to each other in the MDS space. Moving on to the second cluster (Group 2), Hotel-4, Hotel-7, Hotel-9, and Hotel-10 are positioned in closer proximity to each other compared to the other clusters. Finally, the third cluster (Group 3) consists of Hotel-2, Hotel-3, Hotel-5, and Hotel-6, which are located farther apart from those in groups 1 and 2. This suggests that they may possess different characteristics or features in the original dataset.

When creating perception maps, it is crucial to use easily understandable figures to make this tool effective. Confusing data often paralyzes executives, causing few strategic plans to be implemented. Graphs displaying a company's strategic profile and product positions are much easier to comprehend than tables full of quantitative data or paragraphs of text. Therefore, using easily understandable and communicable information is imperative to properly position the organization (W. C. Kim & Mauborgne, 2002).

Lovelock's example of the Palace Hotel demonstrates this approach, where a clear understanding of the company's current situation is sought before discussing changes in strategy. Visual presentations allow managers to compare their business with competitors, understand the nature of competitive threats and opportunities, and highlight gaps between customer perceptions and management's perception of the organization. These presentations can confirm or dispel beliefs regarding a service or company's exclusive niche in the market (Lovelock et al., 2022).

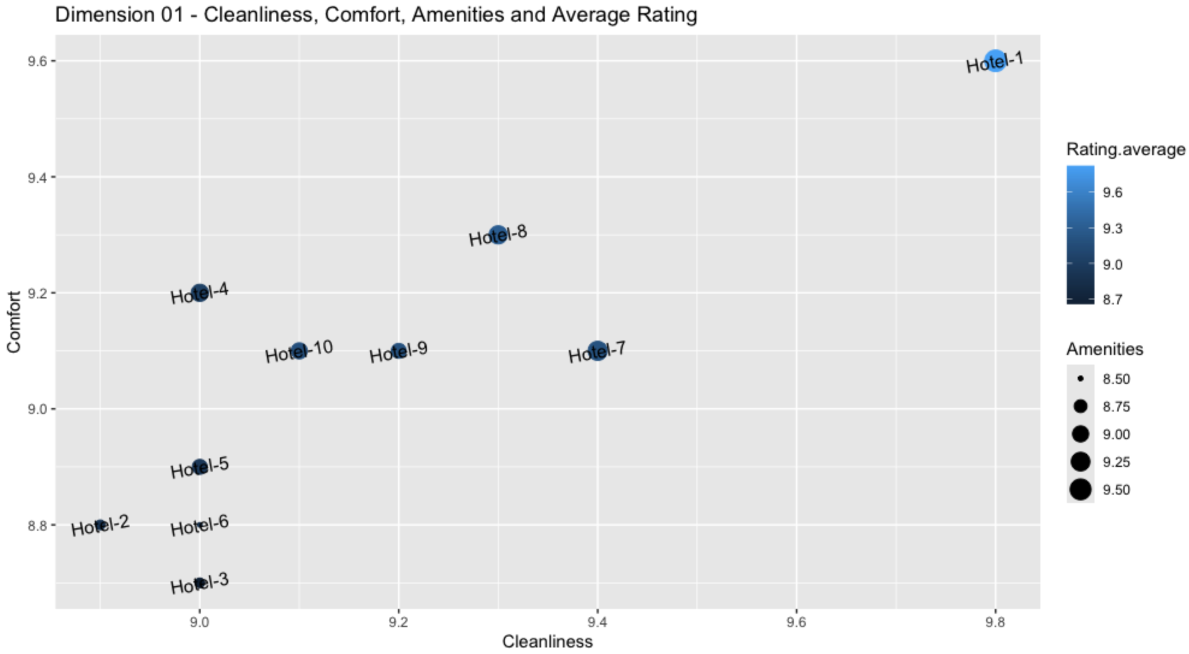
With this goal, we used another methodology for constructing a Positioning Map, Principal Components Analysis (PCA), a data reduction approach used to identify a number of independent linear combinations of underlying explanatory variables for a larger set of observed variables. PCA reproduces all information in the original correlation matrix and creates a new set of uncorrelated variables ordered by the percentage of the total variance they account for. The first principal component has the greatest sample variance; subsequent components are defined similarly (Mingoti, n.d.; Sheldon Zedeck et al., 2014).

The authors used PCA to select the most significant dimensions based on Eigenvalues. They identified that dimensions 1 (43.48%), 2 (21.63%), and 3 (13.99%) accounted for approximately 79.10% of the data variance. The first three dimensions capture most of the variability in the data. This indicates that the dataset's structure can be effectively represented in a lower-dimensional space (3 dimensions), reducing complexity while retaining most of the information. By focusing on the first few components, we capture the most significant patterns in the data while minimizing noise from less important dimensions.

Three perception maps were created using the principal variables based on these dimensions. The authors used R's ggplot2 package to construct these maps, which can display two to four variables by changing the color and size of the points (Wickham, 2016).

Figure 2 illustrates a two-dimensional solution for ten hotels, along with four variables that make up dimension 1 – Cleanliness, Comfort, Amenities, and Average Rating.

Figure 2 – Perception map using main variables of Dimension 1- Quality and Service-Related Characteristics



Source: research data (2024).

Dimension 1 captures aspects related to the overall quality and service provided by hotels, with key contributing variables being "Amenities" (18.01%), "Comfort" (16.81%), "Cleanliness" (16.62%), and "Rating.average" (17.22%). These variables, strongly correlated with Dimension 1, are well-represented, as indicated by high cos2 values: "Amenities" (0.94), "Comfort" (0.88), and "Cleanliness" (0.87). Among the evaluated hotels, Hotel-1 stands out with exceptional scores in cleanliness (9.8), comfort (9.6), amenities (9.6), and an average rating of 9.82, reflecting superior quality and service. Hotel-8 follows with high scores in cleanliness (9.3), comfort (9.3), amenities (9.2), and an average rating of 9.30, while Hotel-7 also performs commendably with cleanliness (9.4), comfort (9.1), amenities (9.3), and an average rating of 9.20. Hotel-9 and Hotel-10 show good performance in quality-related aspects, albeit slightly below the top performers.

The data in Figure 2 shows that factors like Amenities, Comfort, Cleanliness, and Average Rating are closely linked. These aspects significantly influence guests' views on hotel quality and service. Guests value not only tangible aspects such as room comfort and cleanliness, but also expect modern amenities, even in hotels near historic areas.

Among the hotels assessed, Hotel-1 stands out in all key quality areas, particularly in cleanliness (9.8) and comfort (9.6), with an overall average of 9.82. This high score indicates that Hotel-1 meets and exceeds guest expectations, striking a good balance between service quality and amenities. Hotels 7, 8, 9, and 10 also perform well but rank a bit lower, showing differences in perceived quality among the top-rated hotels.

Figure 3 displays a two-dimensional solution for the three variables constituting dimension 2: the type of rooms and customer group couples and families with kids.

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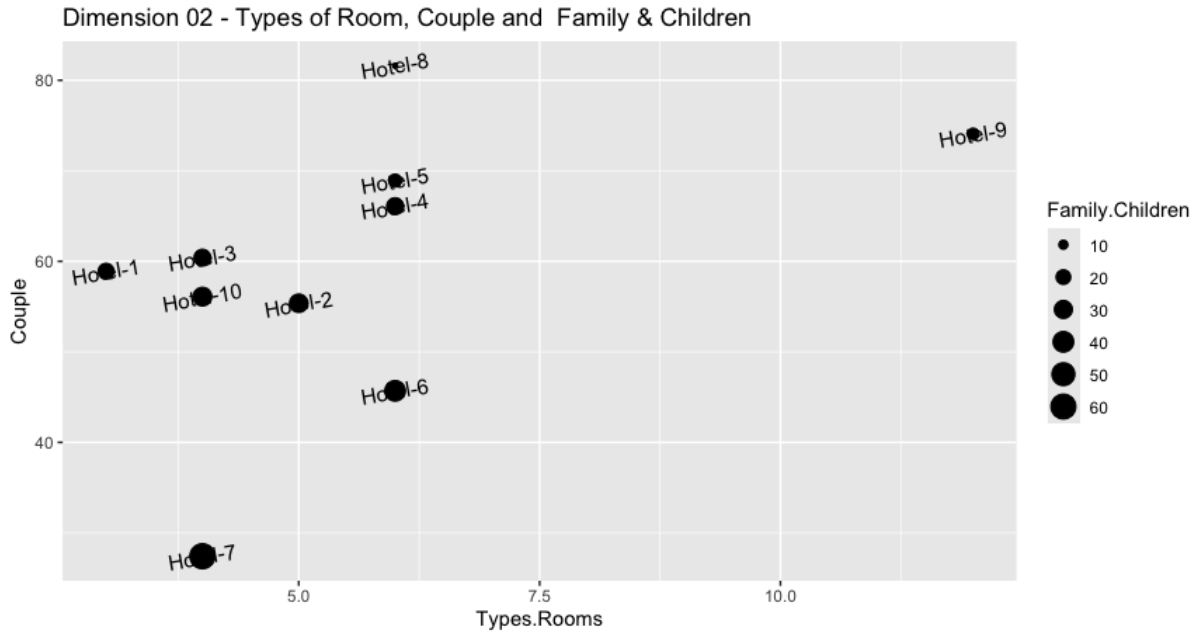
Figure 3 – Perception map using main variables of Dimension 2 – Guest Preferences and Room Types



Source: research data (2024).

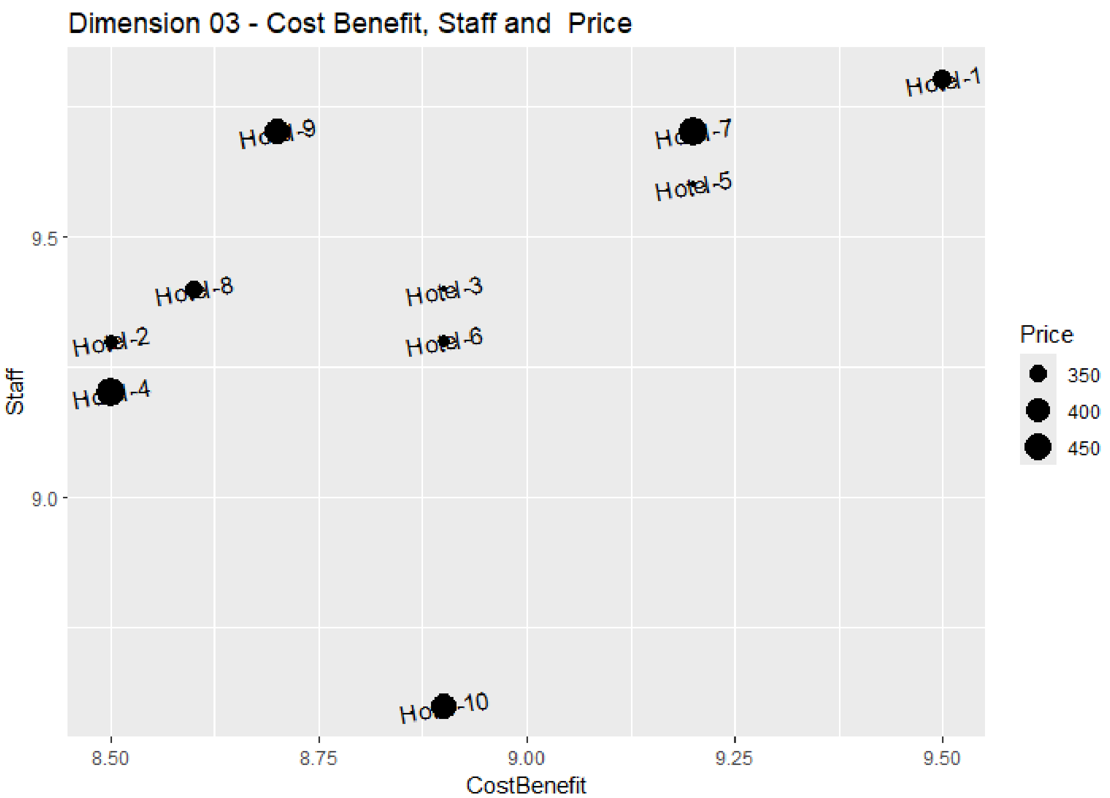
Dimension 2 differentiates hotels based on guest types and room preferences, with key contributing variables being "Couple" (34.87%), "Family.Children" (33.99%), and "Types.Rooms" (15.41%). Strongly correlated with guest-related preferences, "Couple" (cos2 = 0.90) and "Family.Children" (cos2 = 0.88) highlight the dimension's focus on distinguishing hotels by their appeal to couples and families with children. In the analysis, Hotel-8 emerged as the top choice for couples but scored low for families, suggesting limited suitability for guests with children. Conversely, Hotel-7 received the highest score for families, while being less appealing to couples. Both Hotel-9 and Hotel-5 demonstrated strong appeal to couples and moderate suitability for families, whereas Hotel-2 and Hotel-6 balanced their appeal across both guest types, catering to a diverse audience.

The analysis of Dimension 2 underscores the importance of accommodating different types of guests and their preferences, particularly focusing on couples and families with children. This dimension comprises factors such as room type and guest category, which together account for 84.27% of its variance, highlighted by the significant contributions of the Couple and Family with children variables. The strong representation of these variables indicates that hotels that can effectively cater to these customer segments—by offering appropriate room types and personalized amenities—are better positioned to meet the specific needs of the predominant guests in this region. These findings emphasize the strategic value of understanding guest segmentation and aligning hotel offerings to fulfill varying customer expectations.

From a practical perspective, the analysis reveals significant differences in hotel attractiveness among the guest groups studied. For example, Hotel-8 is highly preferred by couples but has limited appeal for families with children, making it more suitable for romantic or couple-oriented experiences. In contrast, Hotel-7 stands out as the preferred choice for families with children, reflecting its focus on family accommodation. Hotels 2 and 6 maintain moderate attractiveness for both types of guests, demonstrating a balanced approach that may appeal to a more diverse customer base.

Figure 4 displays a two-dimensional solution for the Price, Cost-Benefit(Value for money) and Staff forming Dimension 3.

Figure 4 – Perception map using main variables of Dimension 3 – Economic Factors



Source: research data (2024).

Dimension 3 reflects economic considerations, focusing on price, cost-benefit, and staff-related factors, with key contributing variables being "Price" (34.22%), "Staff" (24.33%), and "CostBenefit" (16.99%). While "Price" (cos2 = 0.57) and "Staff" (cos2 = 0.41) are moderately correlated with this dimension, it primarily captures the economic aspects of the hotels. Hotel-7, with the highest price, stands out for its excellent "Staff" and "CostBenefit" scores, targeting a premium market by delivering superior service and value. Similarly, Hotel-4 caters to the premium segment but offers slightly less value for money compared to Hotel-7. In contrast, Hotel-3 and Hotel-5 appeal to cost-conscious guests with lower prices and strong cost-benefit ratios. Finally, Hotel-1 strikes an effective balance between cost and quality, making it an attractive option for a broader range of customers.

The analysis of Dimension 3 highlights two economic factors important for evaluating hotel quality, particularly regarding price, value for money, and staff performance. The literature indicates that while customers consider price when assessing a hotel, they often place a greater emphasis on the quality of service provided (Ali et al., 2021; Dabestani et al., 2016) . This aspect is crucial for guests' intentions to return, as they associate good value for money with a positive experience. Additionally, staff performance is identified as a key factor, as their willingness to assist, professionalism, and ability to handle complaints significantly influence customer satisfaction (Kalnaovakul & Promsivapallop, 2023). Consequently, Dimension 3 captures these elements by showing a moderate correlation between “Price” and “Staff,” suggesting that economic factors are moderately important for perceived quality in the hotel sector.

Examining hotels from an economic perspective reveals how various pricing and service strategies attract specific customer segments. For instance, “Hotel-7,” which has the highest price among those evaluated, targets the premium market, justifying its costs with high staff performance and excellent value for money. In contrast, Hotel-4 slightly lags in value for money compared to Hotel-7. Meanwhile, “Hotel-3” and “Hotel-5” are recognized for offering lower prices while still providing good value, appealing to more price-sensitive guests. Conversely, “Hotel-1” strikes a balance between cost and quality, making it attractive to a broader audience.

Table 4 offers a clear overview of the three key dimensions identified in the analysis of hotel quality and service perception. These dimensions—Quality and Service, Guest Preferences and Room Types, and Economic Factors—represent distinct aspects that influence guest satisfaction and hotel performance. The table outlines the specific characteristics of each dimension, highlights the hotels that excel in these areas, and details how these hotels cater to diverse customer needs and economic segments.

Table 4 – Summary table of the three dimensions in the hotels analyzed.

Dimension	Description	Top-Performing Hotels	Characteristics of Top-Performing Hotels
Dimension 1: Quality and Service-Related Characteristics	It encompasses factors like Comfort, Cleanliness, Amenities, and Average Rating, which influence guests' perception of hotel quality.	Hotel-1, followed by Hotels 7, 8, 9, and 10	Hotel-1 has an overall average of 9.82, meeting and exceeding guest expectations. Other top hotels show slight variations.
Dimension 2: Guest Preferences and Room Types	It focused on the hotels' adaptability to different guest types, such as couples and families with children.	Hotel-8 for Couples, Hotel-7 for Families with Children; Hotels 2 and 6 maintain balanced appeal for both groups	Hotel-8 is highly preferred by couples, while Hotel-7 is more suitable for families with children. Hotels 2 and 6 maintain a balanced appeal for both couples and families.
Dimension 3: Economic Factors	It encompasses economic aspects like Price, Value for Money, and Staff Performance, affecting quality perception in hotels.	Hotel-7 for the premium market, followed by Hotel-4; Hotels 3 and 5 with lower prices and good value for money, catering to budget-conscious.	Hotel-7 has the highest price, with excellent staff performance and value for money, targeting the premium market. Hotel-4 is also premium but slightly lower in value for money.

Source: research data (2024).

5 Conclusions and final remarks

This work started from the premise that the internet presents many interesting opportunities for understanding consumer choice. Researchers in hospitality can potentially use any data displayed on travel websites as a source of information (Han & Anderson, 2021).

This research aims to contribute to the use of eWOM in tourism marketing by proposing a method for perceptual mapping.

This work aims to showcase and promote wider usage of existing electronic word-of-mouth (eWOMs) across various online platforms in the hospitality industry. Our approach can be highly beneficial in countries like Brazil, where a majority of companies in the hospitality sector are small and medium-sized enterprises that lack the necessary resources to conduct a formal and expensive market analysis.

Perceptual mapping is a tool utilized in marketing research to position products and monitor shifts in consumer perception within the market. It can offer valuable insights for strategic analysis by identifying strengths and weaknesses based on certain attributes. By leveraging this approach, hotels can uncover positioning opportunities to enhance specific aspects of their services. Therefore, strategies grounded in perceptual mapping can aid in achieving steady growth and increasing profits (Gigauri, 2019; Gower et al., 2010).

Positioning maps based on eWOM have significant practical implications for hotel managers, particularly concerning market segmentation. Since travel motivations can vary greatly (e.g., leisure, business, events), the quality attributes that tourists value also differ by segment. This suggests the necessity of creating specific positioning maps for each type of traveler, taking into account the purpose of their trip.

In the case analyzed, where the majority of tourists were motivated by leisure, the positioning map is especially useful for identifying the attributes most highly rated by guests in this segment. This allows for the personalization of services offered. However, managers catering to a diverse range of traveler profiles should recognize the need to diversify their strategies in order to remain competitive across different markets.

Important concerns for both marketing researchers and managers have been identified in this paper. Managers should recognize the needs of their customers and devise appropriate strategies to fulfill them. The method of perceptual mapping provides a consistent understanding of customers' perceptions and allows for studying the most significant attributes related to the service. Companies must concentrate on developing their areas of expertise and building customer loyalty. By creating favorable impressions in customers' minds, companies can succeed in competitive markets through effective operations.

The process of perceptual mapping involves data collection, analysis and presentation. Any subjects rated on a range of attributes can be mapped to show their relative positions relative to other subjects and the evaluative attributes. However, the choice of attributes to be incorporated into the perception maps must be analyzed in light of the region's characteristics and the market the company serves (Gigauri, 2019; Gower et al., 2010).

This research aims to enhance the use of electronic word-of-mouth (eWOM) in tourism marketing by introducing a method for creating perceptual maps. It should be noted that the method proposed in this research is not the only or the best one. Innovative and improved strategies can be formulated using perceptual maps to represent the service offerings based on identified dimensions.

Managers can use this study's findings to use better the perception map developed from guest feedback on hotel evaluation and reservation sites. These platforms are a valuable resource for receiving feedback, complaints, and suggestions from guests, and managers should use this information in a structured way by relying on available computational tools.

The study has several limitations that should be acknowledged. First, the sample consists of a small number of hotels located in a single city in Minas Gerais, which limits the generalization of the findings. A small and regionally confined sample may not adequately capture the diversity of market dynamics, guest profiles, or operational practices found in broader geographical areas. As a result, the findings may not reflect the experiences or perceptions of guests in other regions, restricting the applicability of the conclusions to different contexts or segments of the hospitality industry.

Second, the data were exclusively obtained from Booking.com, which is a single online platform. While Booking.com is known for its authentic reviews, the feedback on this platform only includes customers who booked their stays through it. This may leave out insights from guests who used alternative booking methods or platforms, leading to a partial understanding of customer satisfaction and hotel performance, as preferences and expectations can differ among users of other platforms.

To address these limitations in future research, it would be beneficial to expand the sample size, including multiple cities and diverse regions, and incorporate data from various online review platforms. This approach would enhance the robustness and generalizability of the findings.

While this research has demonstrated the effectiveness of perceptual mapping as a marketing research tool in the hospitality industry, it has also raised questions that require further investigation. For example, to what extent do online reviews and the information available on these platforms provide a solid basis for evaluating hotels on the market? What are the most appropriate web scraping and text mining techniques for processing and analyzing the information on these sites? Additionally, there is a need to develop robust typologies and positioning models with data collected from these sources, and we hope that the strategy used and proposed will be subjected to further testing and cross-validation.

References

Afifi, A., May, S., Donatello, R. A., & Clark, V. A. (2020). *Practical Multivariate Analysis* (Sixth Edition). CRC Press.

Ali, B. J., Gardi, B., Othman, B. J., Ahmed, S. A., Ismael, N. B., Hamza, P. A., Aziz, H. M., Sabir, B. Y., Sorguli, S., & Anwar, G. (2021). Hotel Service Quality: The Impact of Service Quality on Customer Satisfaction in Hospitality. *International Journal of Engineering, Business and Management*, *5*(3), 14–28. https://doi.org/10.22161/ijebm.5.3.2

Ali Taha, V., Pencarelli, T., Škerháková, V., Fedorko, R., & Košíková, M. (2021). The Use of Social Media and Its Impact on Shopping Behavior of Slovak and Italian Consumers during COVID-19 Pandemic. *Sustainability*, *13*(4), 1710. https://doi.org/10.3390/su13041710

Anagnostopoulou, S. C., Buhalis, D., Kountouri, I. L., Manousakis, E. G., & Tsekrekos, A. E. (2020). The impact of online reputation on hotel profitability. *International Journal of Contemporary Hospitality Management*, *32*(1), 20–39. https://doi.org/10.1108/IJCHM-03-2019-0247

Aydin, O. (2018). *R Web Scraping Quick Start Guide: Techniques and tools to crawl and scrape data from websites*. Published by Packt Publishing Ltd.

Bache, S., & Wickham, H. (2022). *magrittr: A Forward-Pipe Operator for R*. R package version 2.0.3.

Bagozzi, R. P., Rosa, J. A., Celly, K. S., & Coronel, F. (1998). *Perceptual Maps and Product Positioning*. Prentice Hall.

Bolson, J. G., Ferreira, M. A. T., & Vieira Filho, N. A. Q. (2006). Os Impactos do Turismo em Tiradentes: uma Análise da Percepção do Setor Público Local. *Revista Reuna*, *11*(1), 29–39.

Boon, E., Bonera, M., & Bigi, A. (2013). *Measuring Hotel Service Quality from Online Consumer Reviews: A Proposed Method BT - Information and Communication Technologies in Tourism 2014* (Z. Xiang & I. Tussyadiah, Eds.; pp. 367–379). Springer International Publishing.

Boon-itt, S., & Rompho, N. (2012). Measuring Service Quality Dimensions: An Empirical Analysis of Thai Hotel Industry. *International Journal of Business Administration*, *3*(5). https://doi.org/10.5430/ijba.v3n5p52

Cotton, R. (2017). *rebus: Build Regular Expressions in a Human Readable Way*. R package version 0.1-3.

Dabestani, R., Shahin, A., Saljoughian, M., & Shirouyehzad, H. (2016). Importance-performance analysis of service quality dimensions for the customer groups segmented by DEA: The case of four star hotels. *International Journal of Quality and Reliability Management*, *33*(2), 160–177. https://doi.org/10.1108/IJQRM-02-2014-0022

Faullant, R., Matzler, K., & Füller, J. (2008). A positioning map of skiing areas using customer satisfaction scores. *Journal of Hospitality and Leisure Marketing*, *16*(3), 230–245. https://doi.org/10.1080/10507050801946833

Gigauri, I. (2019). Perceptual Mapping as a Marketing Research Tool for Brand Positioning. *International Journal of Economics and Management Studies*, *6*(4), 73–79. https://doi.org/10.14445/23939125/ijems-v6i4p110

Gower, J. C., Groenen, P. J. F., Van de Velden, M., & Vines, K. (2010). Perceptual maps: The good, the bad and the ugly. *ERIM Report Series Research in Management*, *RES-2010-011-MKT*, 30. http://hdl.handle.net/1765/18462

Grolemund, G., & Wickham, H. (2011). Dates and Times Made Easy with lubridate. *Journal of Statistical Software*, *40*(03), 1–25.

Han, S., & Anderson, C. K. (2021). Web Scraping for Hospitality Research: Overview, Opportunities, and Implications. *Cornell Hospitality Quarterly*, *62*(1), 89–104. https://doi.org/10.1177/1938965520973587

Harrison, J. (2022). *RSelenium: R Bindings for 'Selenium WebDriver*.

Hsiao, Y. H., & Hsiao, Y. T. (2021). Online review analytics for hotel quality at macro and micro levels. *Industrial Management and Data Systems*, *121*(2), 268–289. https://doi.org/10.1108/IMDS-04-2020-0214

Ismagilova, E., Dwivedi, Y. K., Slade, E., & Williams, M. D. (2017). Electronic Word of Mouth (eWOM) in the Marketing Context. In *SpringerBriefs in Business*. http://link.springer.com/10.1007/978-3-319-52459-7

Kalafatis, S. P., Tsogas, M. H., & Blankson, C. (2000). *Positioning strategies in business markets. Journal of Business & Industrial Marketing*, *15*(6), 416–437.

Kalnaovakul, K., & Promsivapallop, P. (2023). Hotel service quality dimensions and attributes: An analysis of online hotel customer reviews. *Tourism and Hospitality Research*, *23*(3), 420–440. https://doi.org/10.1177/14673584221145819

Kassambara, A. (2023). *ggpubr: 'ggplot2' Based Publication Ready Plots*. R package version 0.6.0.

Kim, D. J., Kim, W. G., & Han, J. S. (2007). A perceptual mapping of online travel agencies and preference attributes. *Tourism Management*, *28*(2), 591–603. https://doi.org/10.1016/j.tourman.2006.04.022

Kim, W. C., & Mauborgne, R. (2002). Charting Your Company's Future. *Harvard Business Review*, *80*(July), 77–83.

Knutson, B. J. (2000). College Students and Fast Food—. *Cornell Hotel and Restaurant Administration Quarterly*, *41*(3), 68–74. https://doi.org/10.1177/001088040004100318
Lambin, J. J. (2011). Market Targeting and Positioning Decisions. *Market-Driven Management*, *January 2018*, 280–296.

Lê, S., Josse, J., & Husson, F. (2008). FactoMineR : An R Package for Multivariate Analysis. *Journal of Statistical Software*, *25*(1). https://doi.org/10.18637/jss.v025.i01

Lee, P.-J., Hu, Y.-H., & Lu, K.-T. (2018). Assessing the helpfulness of online hotel reviews: A classification-based approach. *Telematics and Informatics*, *35*(2), 436–445. https://doi.org/10.1016/j.tele.2018.01.001

Liu, X., Schuckert, M., & Law, R. (2018). Utilitarianism and knowledge growth during status seeking: Evidence from text mining of online reviews. *Tourism Management*, *66*, 38–46. https://doi.org/10.1016/j.tourman.2017.11.005

Lovelock, C. H., Wirtz, J. (2022). *Services marketing: people, technology, strategy* (9th ed.). World Scientific Publishing Co. Inc.

Mellinas, J. P., & Martin-Fuentes, E. (2021). Effects of Booking.com's new scoring system. *Tourism Management*, *85*(December 2020), 104280. https://doi.org/10.1016/j.tourman.2020.104280

Mingoti, S. A. (n.d.). *Análise de dados através de métodos de estatística multivariada: uma abordagem aplicada*. Editora UFMG. Retrieved 3 January 2015, from https://books.google.com/books?id=W7sZllHmmGIC&pgis=1

Nicholas, C. K. W., & Lee, A. S. H. (2017). Voice of customers: Text analysis of hotel customer reviews (Cleanliness, overall environment and value for money). *ACM International Conference Proceeding Series*, *Part F1325*, 104–111. https://doi.org/10.1145/3152723.3152739

Ooms, J. (2023). *sys: Powerful and Reliable Tools for Running System Commands in R*. R package version 3.4.2.

R Core Team. (2022). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing.

Rondan-Cataluña, F. J., & Rosa-Diaz, I. M. (2014). Segmenting hotel clients by pricing variables and value for money. *Current Issues in Tourism*, *17*(1), 60–71. https://doi.org/10.1080/13683500.2012.718322

Sann, R., Lai, P. C., & Chen, C. T. (2021). Review papers on eWOM: prospects for hospitality industry. *Anatolia*, *32*(2), 177–206. https://doi.org/10.1080/13032917.2020.1813183

Schauberger, P., & Walker, A. (2023). *openxlsx: Read, Write and Edit xlsx Files*. R package version 4.2.5.2.

Serra Cantallops, A., & Salvi, F. (2014). New consumer behavior: A review of research on eWOM and hotels. *International Journal of Hospitality Management*, *36*, 41–51. https://doi.org/10.1016/j.ijhm.2013.08.007

Sheldon Zedeck, Harlow, L. L., Blozis, S. A., & Panter, A. T. (2014). *APA dictionary of statistics and research methods*. American Psychological Association. https://doi.org/10.1037/14336.000

Surovitskikh, S., & Lubbe, B. (2008). Positioning of selected Middle Eastern airlines in the South African business and leisure travel environment. *Journal of Air Transport Management*, *14*(2), 75–81. https://doi.org/10.1016/j.jairtraman.2007.12.001

Urde, M., & Koch, C. (2014). Market and brand-oriented schools of positioning. *Journal of Product and Brand Management*, *23*(7), 478–490. https://doi.org/10.1108/JPBM-11-2013-0445

Uysal, M., Chen, J. S., & Williams, D. R. (2000). Increasing state market share through a regional positioning. *Tourism Management*, *21*(1), 89–96. https://doi.org/10.1016/S0261-5177(99)00082-5

van Zyl, C. (2017). Positioning maps: a conjoint analysis tool for festival or event application. *International Journal of Tourism Cities*, *3*(4), 424–441. https://doi.org/10.1108/IJTC-06-2017-0034

Vo, N. T., Hung, V. V., Tuckova, Z., Pham, N. T., & Nguyen, L. H. L. (2022). Guest Online Review: An Extraordinary Focus on Hotel Users' Satisfaction, Engagement, and Loyalty. *Journal of Quality Assurance in Hospitality and Tourism*, *23*(4), 913–944. https://doi.org/10.1080/1528008X.2021.1920550

Wickham, H. (2016). *ggplot2: Elegant Graphics for Data Analysis*. SPRINGER-VERLAG BERLIN.

Wickham, H. (2022a). *httr: Tools for Working with URLs and HTTP*. R package version 1.4.6.

Wickham, H. (2022b). *rvest: Easily Harvest (Scrape) Web Pages*. R package version 1.0.3.

Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L., François, R., Grolemund, G., Hayes, A., Henry, L., Hester, J., Kuhn, M., Pedersen, T., Miller, E., Bache, S., Müller, K., Ooms, J., Robinson, D., Seidel, D., Spinu, V., … Yutani, H. (2019). Welcome to the Tidyverse. *Journal of Open Source Software*, *4*(43), 1686. https://doi.org/10.21105/joss.01686

Yuan, Y., You, T., Xu, T., & Yu, X. (2022). Customer-Oriented Strategic Planning for Hotel Competitiveness Improvement Based on Online Reviews. *Sustainability (Switzerland)*, *14*(22), 1–30. https://doi.org/10.3390/su142215299

Zhang, Z., Ye, Q., & Law, R. (2011). Determinants of hotel room price. *International Journal of Contemporary Hospitality Management*, *23*(7), 972–981. https://doi.org/10.1108/09596111111167551

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