

Original article

## Sentiment analysis of the textual opinions associated with Las Terrazas resort

### Análisis de sentimientos de las opiniones textuales asociadas al complejo turístico Las Terrazas

### Análise de sentimentos das opiniões textuais associadas ao resort Las Terrazas



Jorge Félix Quintana Cala<sup>1</sup>  0009-0000-0750-4170  [jorgefelixquintanacala@gmail.com](mailto:jorgefelixquintanacala@gmail.com)

Sandro Felipe Acosta Mesa<sup>1</sup>  0000-0002-4170-7892  [sandrofelipeacostamesa@gmail.com](mailto:sandrofelipeacostamesa@gmail.com)

Emilio Enrique Guerra Castellón<sup>1</sup>  0009-0005-2436-7186  [emilito042@gmail.com](mailto:emilito042@gmail.com)

Yasser Vázquez Alfonso<sup>1</sup>  0000-0002-4074-0711  [yasser@ftur.uh.cu](mailto:yasser@ftur.uh.cu)

<sup>1</sup> University of Havana. Faculty of Tourism. Havana, Cuba.

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## ABSTRACT

Sentiment analysis or opinion mining, according to the literature, provides companies with the opportunity to obtain relevant information about customers' reactions to their brand or product. This makes it easier for them to improve their marketing strategies and make decisions more efficiently. The relevance of the subject is fundamental for tourism and for spaces such as Las Terrazas resort, as it facilitates the monitoring of customer satisfaction and market research. Currently, despite its attractiveness, it does not have studies that systematically analyze the perceptions of its visitors through the opinions expressed on TripAdvisor. In this scenario, the present research arises with the objective of analyzing the behavior of the sentiments of the textual opinions associated with Las Terrazas tourist resort. For the development of this research, a methodology structured in five phases was used, which included web scraping techniques, the problem tree and the Pareto diagram tool. In addition, software such as R-Studio, Excel, Paint 3D and the Google Instant Data Scraper extension were used to automatically scrape the opinions. The results reveal a trend decrease in the

number of opinions, with the majority being negative. Overall visitor dissatisfaction was identified as a central problem, which puts the resort's image at risk due to unfavorable reviews and, if no quick action is taken, could worsen the existing situation.

**Keywords:** sentiment analysis; Las Terrazas; opinions; TripAdvisor.

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## RESUMEN

El análisis de sentimiento o minería de opinión, según la literatura, brinda a las empresas la oportunidad de obtener información relevante sobre las reacciones de los clientes en relación con su marca o producto. Esto les facilita la posibilidad de perfeccionar sus estrategias de *marketing* y de tomar decisiones de manera más eficiente. La relevancia del tema es fundamental para el turismo y para espacios como el complejo turístico Las Terrazas, pues facilita el monitoreo de la satisfacción del cliente y la realización de estudios de mercado. Actualmente, a pesar de su atraktividad, este no cuenta con estudios que analicen de manera sistemática las percepciones de sus visitantes a través de las opiniones vertidas en TripAdvisor. En este escenario, surge la presente investigación con el objetivo de analizar el comportamiento de los sentimientos de las opiniones textuales asociadas al complejo turístico Las Terrazas. Para el desarrollo de la misma, se empleó una metodología estructurada en cinco fases, que incluyó las técnicas del *web scraping*, el árbol de problemas y la herramienta diagrama de Pareto. Además, se utilizaron softwares como R-Studio, Excel, Paint 3D y la extensión de Google Instant Data Scraper para raspar las opiniones automáticamente. Los resultados revelan una disminución tendencial en la cantidad de opiniones, siendo la mayoría negativas. Se identificó la insatisfacción general de los visitantes como problema central, lo que pone en riesgo la imagen del complejo debido a las opiniones desfavorables y, si no se toman acciones rápidas, podría empeorar la situación existente.

**Palabras clave:** análisis de sentimiento; Las Terrazas; opiniones; TripAdvisor.

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## RESUMO

A análise de sentimentos ou mineração de opiniões, de acordo com a literatura, oferece às empresas a oportunidade de obter informações relevantes sobre as reações dos clientes à sua marca ou produto. Isso permite que elas refinem suas estratégias de *marketing* e tomem decisões com mais

eficiência. A relevância do tópico é fundamental para o turismo e para locais como o resort Las Terrazas, pois facilita o monitoramento da satisfação do cliente e a pesquisa de mercado. Atualmente, apesar de sua atratividade, não há estudos que analisem sistematicamente as percepções de seus visitantes por meio das opiniões expressas no TripAdvisor. Nesse cenário, a presente pesquisa surge com o objetivo de analisar o comportamento dos sentimentos das opiniões textuais associadas ao complexo turístico Las Terrazas. Para o desenvolvimento desta pesquisa, foi utilizada uma metodologia estruturada em cinco fases, que incluiu as técnicas de *web scraping*, a árvore de problemas e a ferramenta de diagrama de Pareto. Além disso, softwares como o R-Studio, Excel, Paint 3D e a extensão Google Instant Data Scraper foram usados para coletar automaticamente as opiniões. Os resultados revelam uma tendência de redução no número de opiniões, sendo a maioria negativa. A insatisfação geral dos visitantes foi identificada como um problema central, que coloca a imagem do resort em risco devido a avaliações desfavoráveis e, se nenhuma ação rápida for tomada, pode piorar a situação existente.

**Palavras-chave:** análise de sentimento; Las Terrazas; avaliações; TripAdvisor.

## INTRODUCTION

Tourism is a complex phenomenon that involves diverse factors that require careful analysis to achieve effective growth. It is essential that this activity remains receptive to innovation and constant improvement in order to meet the expectations and needs of visitors who demand high quality experiences and services.

Padilla Vargas and Mullo Romero (2020) point out that the tourism sector is undergoing a real transformation, thanks to the integration of Information and Communication Technologies, with the use of the Internet being one of the main drivers of this change. According to the authors, the educational processes implemented in companies maximize the potential of these tools, facilitating interaction at different times and the continuous updating of knowledge.

Information and Communication Technologies have revolutionized the tourism sector, boosting both the supply and demand of services. These have become a fundamental tool for tourism companies to market, distribute and adapt their services to market needs. At the same time, travelers benefit

as they allow them to optimize their time and budget during their trips (Ruiz García & Hernández García, 2017).

Tourism is a sector that is highly influenced by the opinions and ratings of users on platforms such as Booking, TripAdvisor and Lonely Planet. These are a treasure of valuable information that can be used strategically by companies in the sector to improve their marketing and service strategies (Sandoval Almazán & Osorio González, 2021). The ability to automatically classify these opinions into positive, negative or neutral categories offers valuable information that favors the improvement of their services and marketing strategies.

The amount of information obtained from these platforms would be somewhat difficult to process, were it not for the advances in technology. Through programming, it has been possible to extract data from these platforms and subsequently analyze them (Blasco Duatis & Coenders, 2020).

As stated by Henriquez Miranda and Guzman (2015), to better understand these platforms, automatic methods of analysis are needed. Artificial intelligence, especially natural language processing (NLP) techniques, offers a promising avenue to achieve this. Within NLP, opinion mining or sentiment analysis has emerged as a research area of great interest in recent years (Espinola Gonzales et al., 2024).

According to Herrera Flores and Benavides Morales (2022), sentiment analysis refers to a set of applications that use NLP and computational linguistics techniques to extract subjective information from content produced by users in blogs, online surveys, social networks or e-mails. Thanks to these technologies, it is possible to obtain a tangible and direct value from textual comments, which can be both positive and negative. Multiple researches have been carried out in the area, employing different NLP techniques (Mishra et al., 2023).

Kim et al. (2021) describe it as an emotion detector that examines texts, looking for clues in the words used. This analysis organizes opinions according to the tendency expressed by the author, processing the information automatically.

Thematic has gained momentum as a crucial tool in the field of tourism, especially in an increasingly digitized world, where the opinions of consumers are shared and viralized through various online platforms (Moro et al., 2017). Its main objective is to better understand travelers' perceptions and

state of mind, which in turn facilitates informed decision-making to improve the quality of services and customer experience.

Review platforms, such as TripAdvisor, have become invaluable sources of information, where millions of users share their experiences and ratings. This feedback not only influences the decision of other travelers, but also provides destination managers and tourism companies with a clear view of areas that need attention and improvement (Hu et al., 2017).

Las Terrazas, a tourist resort located in Candelaria municipality, Artemisa province, is an emblematic example of the Cuban tourist offer, an enclave of singular values that has managed to merge man and nature with great success (Ramírez Pérez & Pérez Hernández, 2007). It stands out for its historical and cultural heritage and its rich biodiversity. Its potential for nature and cultural tourism positions it as an engine of economic development for the region.

However, despite being an attractive destination, there is a notable scarcity of studies that systematically analyze visitor opinions on TripAdvisor. This lack of information about the resort's tourism offerings creates a gap between visitors' expectations and what is actually offered, which can lead to customer dissatisfaction. In a competitive environment, where tourists have multiple choices, understanding these reviews is critical to ensure the sustainability and growth of the resort.

Without proper analysis, improvement opportunities and marketing strategies may not align with actual visitor expectations, which could result in a loss of market share to other destinations that are using these analytical tools (de Oliveira Santini et al., 2020).

Therefore, from the observations and content analysis previously carried out, the authors propose the need to apply a sentiment analysis to detect the elements that influence the visitors' experience in the tourist resort. From this, the present research arises, whose objective is to analyze the sentiment behavior of the textual opinions associated with Las Terrazas tourist resort.

## **MATERIALS AND METHODS**

For the development of the research a methodology structured in five phases was used, as shown in figure 1.



**Figure 1.** Methodological design of the research

Source: Own elaboration

A descriptive type of research was conducted with a mixed approach, using a quantitative analysis to measure the general sentiment of visitors' opinions, complemented with a qualitative analysis to identify issues that affect the negative sentiments of customers. The study population included all opinions published about Las Terrazas Tourist Resort on TripAdvisor during the last 10 years.

In the first phase, the profile "Complejo Las Terrazas" was identified on TripAdvisor, in which 185 opinions were identified. In the second phase, the opinions were extracted from the platform in a Microsoft Excel file. Subsequently, in the third phase, a representative sample of 77 opinions was chosen, applying specific selection criteria such as: opinions in Spanish language and opinions with a minimum length of 30 words to ensure the richness of the content. In the fourth phase, the opinions were processed using R-Studio packages. Subsequently, in the fifth phase, the results obtained were analyzed and interpreted.

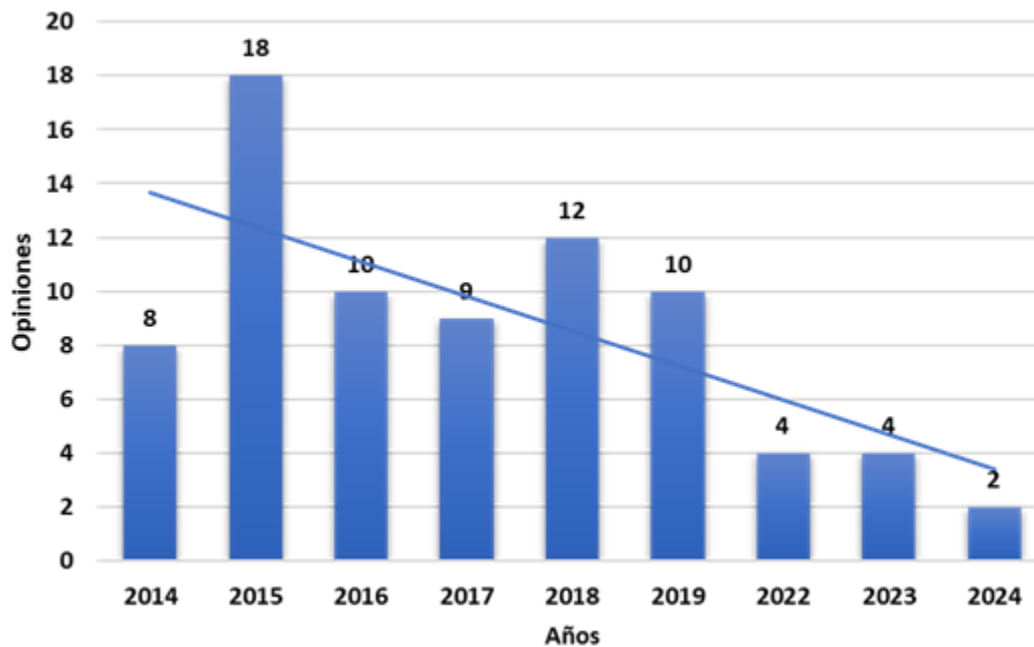
The analytical-synthetic method was applied to explore the existing literature and identify the main theoretical elements of sentiment analysis, and the inductive-deductive method was used to find patterns in the data and then apply the knowledge acquired to draw conclusions. Likewise, a literature and documentary review was carried out to identify various background, conceptual, theoretical and methodological frameworks. The use of statistical-mathematical methods, such as descriptive statistics through statisticians and graphs, made it possible to understand trends and the evolution of opinions over time.

To perform the sentiment analysis, the Google Instant Data Scraper extension was used to extract TripAdvisor opinions and automatically obtain a database. The use of the R-Studio software was given from its different open-source libraries, to obtain the graphs of sentiment polarizations, the percentage of perceived emotions and the time series. The UCINET software was used to elaborate the consistency matrix between opinions and the number of perceived emotions, which made it possible to create a network of relationships to identify trends. Microsoft Excel was used to create tables, matrices and specific graphs.

The problem tree technique (developed in Paint 3D) was used to identify the main problem through a cause-effect relationship and the Pareto diagram was used to analyze the data, prioritize the problems and focus improvement efforts on the most relevant aspects, maximizing the positive impact on visitor satisfaction.

## RESULTS AND DISCUSSION

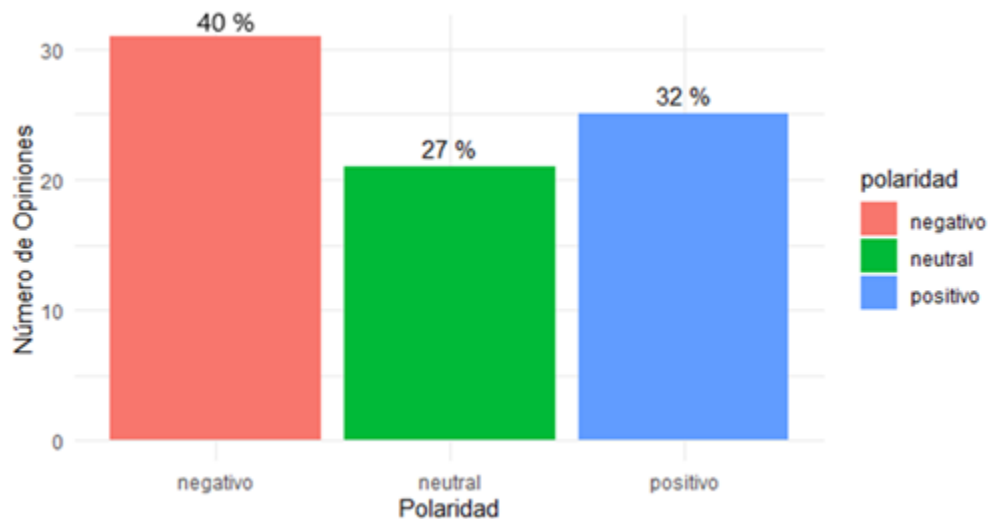
Once the opinions were processed and analyzed, it was observed that Las Terrazas Tourist Resort has a moderately small number of reviews on TripAdvisor, with a total of 77 opinions in Spanish. These reviews are distributed over time, as shown in figure 2.



**Figure 2.** Time distribution of opinions  
Source: Own elaboration in Microsoft Excel

Varying interest in opinions over the years is evident, with a notable increase in 2015, followed by fluctuations and a significant drop in 2020 and 2021. The lack of opinions in these years, along with the low number in recent years was directly marked by the arrival of COVID-19 in 2020. After a detailed analysis of all opinions, several possible causes were identified, such as a low tourist influx, a decrease in popularity or other significant events that affected the ability or interest of users to give their opinion, such as a crisis, a change in the product or service, or even accessibility issues.

As a result of this thorough analysis, opinions were classified as positive, negative or neutral, in addition to investigating the accompanying emotional complexities. The distribution of polarized opinions as shown in figure 3 reveals significant patterns. It can be seen how most of the opinions, 31 (40 %), were classified as negative, considering factors such as: complaints about poor service, poor care of the environment, high prices, little diversification of the offer, overbooking of services, indicating that a significant number of visitors have had unsatisfactory or disappointing experiences at the resort.



**Figure 3.** Distribution of polarized opinions

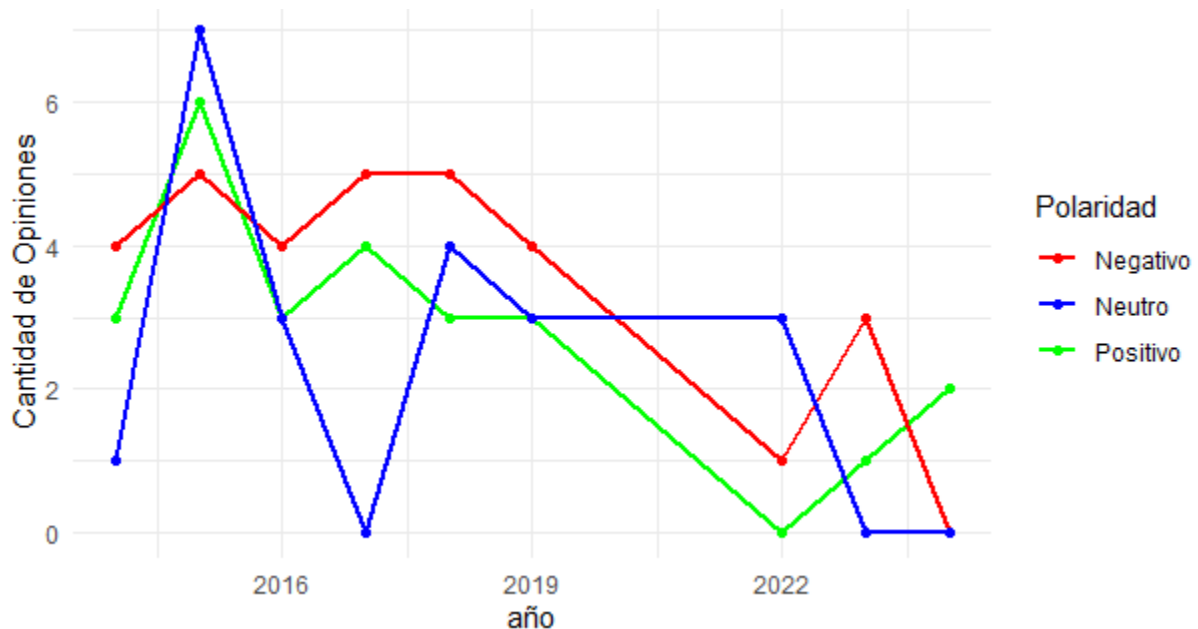
Source: Own elaboration in R-Studio

Although less than half of the opinions are positive, this percentage suggests that there is a group of visitors who have enjoyed their experience at Las Terrazas. These opinions highlight aspects such as the natural beauty of the site, the hospitality of the staff, and pleasant activities.



The existence of a 27% of neutral opinions about the resort indicates that a significant proportion of visitors have neither a clearly positive opinion nor negative opinion about their stay, that is, they have had mixed experiences, characterized by a lack of intense emotions, since some visitors might feel indifferent or dissatisfied if they did not find anything outstanding in their visit, either in terms of services, facilities or activities.

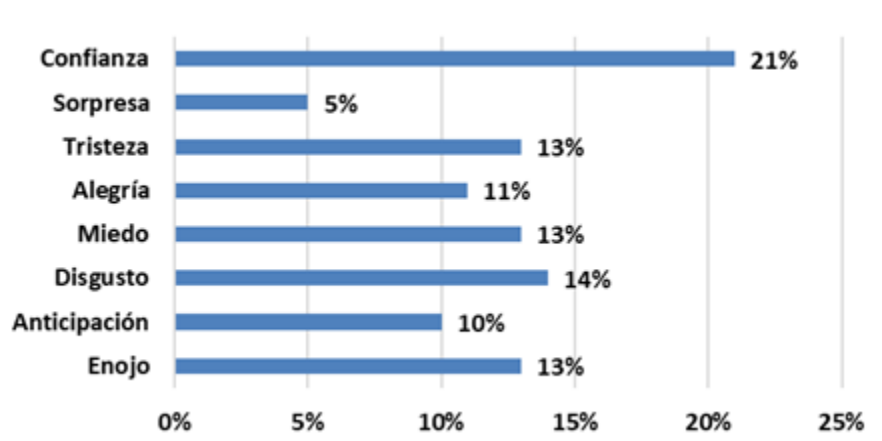
Subsequently, it was examined how the polarity of opinions transformed over time, using a time series approach, as shown in figure 4, which highlights the prevalence of negative opinions, with a decrease in negative opinions for the years 2023 and 2024.



**Figure 4.** Time evolution of the polarity of opinions

Source: Own elaboration in R-Studio

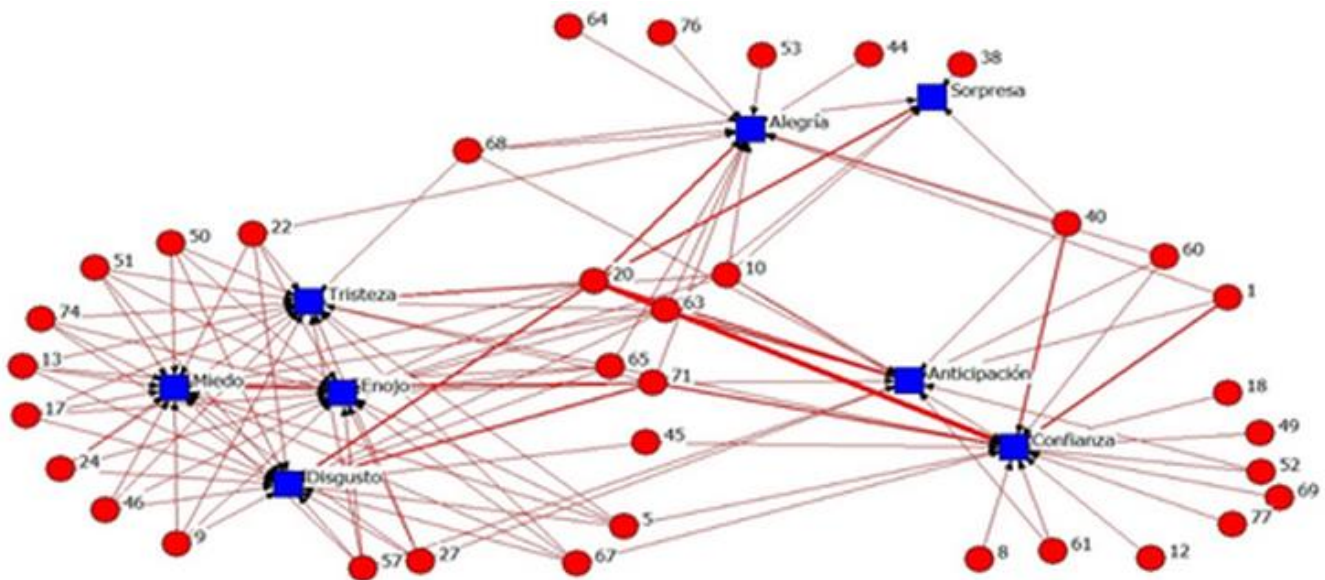
Figure 5 shows the measurement of the emotions observed; the prevalence of positive sentiments of trust is notable, suggesting that many opinions reflect a trustworthy perception of the place. However, despite these positive sentiments, negative sentiments appear with greater consistency, manifesting themselves in significant percentages: anger (13%), disgust (14%), fear (13%) and sadness (13%). This combination of positive and negative emotions indicates that, although there is confidence in the resort, there are also concerns and dissatisfactions that should be considered to improve the visitors' experience.



**Figure 5.** Percentage of perceived emotions

Source: Own elaboration in Microsoft Excel

The prevailing presence of negative sentiments such as fear, anger, disgust and sadness in the network shown in figure 6 and the clustering of opinions around these sentiments reflects specific areas of concern or aspects of the resort that need improvement



**Figure 6.** Network of relationships between emotions and opinions

Source: Own elaboration based on R-Studio, Microsoft Excel and UCINET

Visitors have different expectations and experiences, reflected in the variety of opinions. Customizing tourism offerings to meet diverse preferences can improve overall satisfaction.

As shown in figure 7, the analysis of the opinions and the problem tree identified general visitor dissatisfaction as the central problem affecting the resort. This dissatisfaction originates from a series of interconnected factors that affect tourists' perception of their experience. First, there is the problem of high prices that do not correspond to the quality of services and experiences offered; many visitors feel that the costs do not justify what they receive, generating a feeling of lack of value for money.



**Figure 7.** Problem tree derived from the opinion analysis

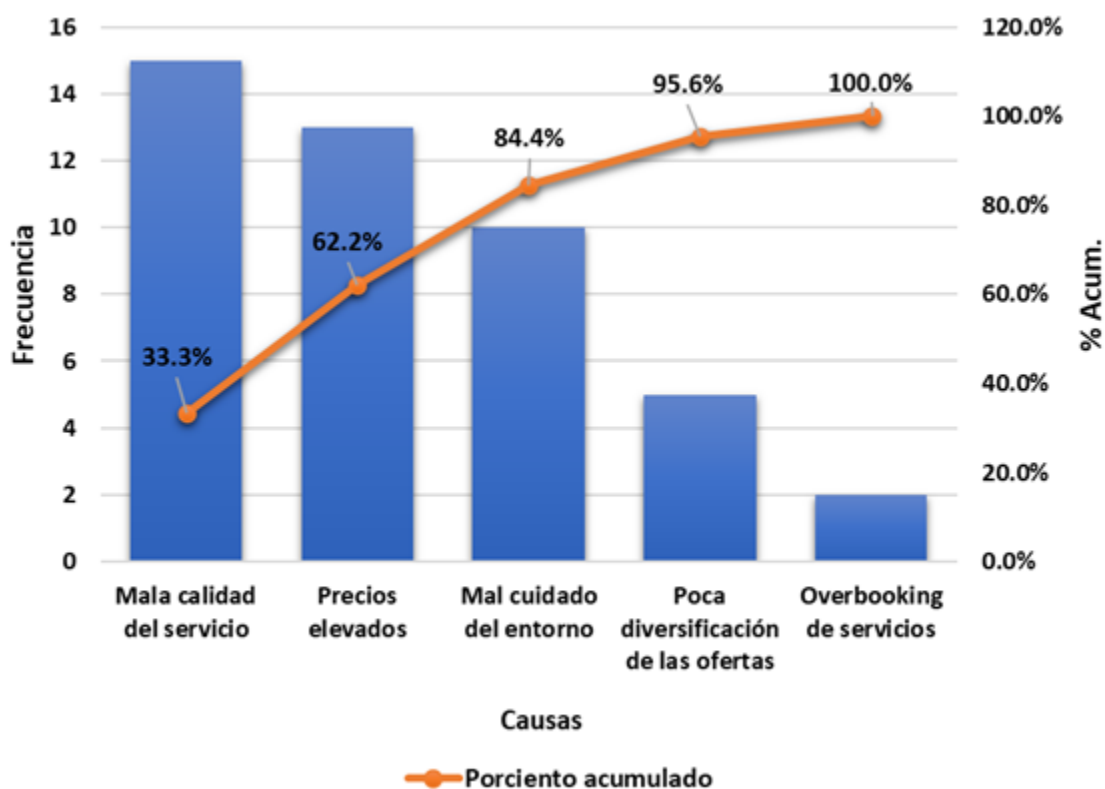
Source: Own elaboration in Paint 3D

Another major concern is the lack of diversification of available offerings, which makes visitors feel limited in their choices and contributes to the perception that the experience is monotonous and unattractive. The phenomenon of overbooking in services also plays a crucial role in dissatisfaction, as it results in not all visitors being able to enjoy what they expected, generating frustration and disappointment.

On the other hand, the quality of service is a critical aspect that has been identified as deficient. The lack of attention from the staff, combined with the perception of a poorly cared for environment, where waste and plastics are observed floating in the river, further aggravates the negative

experience of visitors. All of this translates into significant dissatisfaction, reflected in the fact that 40% of the opinions expressed by visitors focus on these dissatisfactions, highlighting the urgent need to address these issues to improve the overall experience at the resort.

Figure 8 shows a worrisome reality: 62.2% of tourist dissatisfaction at Las Terrazas stems from two main causes: poor quality of service and high prices. This, according to the Pareto principle, indicates that most efforts should be focused on these areas to achieve a significant impact on overall visitor satisfaction.



**Figure 8.** Pareto Diagram

Source: Own elaboration in Microsoft Excel

Improving the quality of service implies not only a friendlier and more efficient customer service, but also the implementation of training programs for personnel, periodic quality audits, and the creation of clear protocols for customer service. Adjusting prices, on the other hand, requires an in-depth analysis of the tourism market and operating costs in order to establish competitive rates that are in

line with the quality offered. An example of this could be the creation of tourist packages with special rates, group discounts or seasonal promotions.

But dissatisfaction is not limited to these two causes. Figure 8 also reflects that care of the environment, including environmental conservation, cleanliness of tourist areas and promotion of sustainable practices, also play a crucial role, since together with the two main causes they represent 84.4% of the total dissatisfaction. To significantly improve the situation, achieve greater satisfaction of visitors and position Las Terrazas as an attractive and sustainable tourist destination, it is necessary to implement a strategic action plan that addresses these three priority areas.

The remaining causes of dissatisfaction (15.6%) are key areas of study and analysis to complete the picture of the problem and determine if they are relevant enough to be included in the improvement strategy.

Most studies that apply sentiment analysis in the academic literature have done so on English text corpora, therefore, this research provides an important overview of automatic classification algorithms that can be employed to process Spanish texts.

The integration of natural language processing and machine learning techniques has revolutionized the way textual data is analyzed and understood in various contexts. In this digital age, where information is constantly flowing through social platforms, blogs, news and more, these techniques have become fundamental tools for extracting valuable insights.

In the exploration of natural language processing and machine learning techniques for sentiment analysis in social networks and web pages, the richness of approaches is manifested in the diversity of studies addressed by different authors. For example, Callarisa Fiol et al. (2012), although their approach is not computational, perform an analysis of the relationships that exist between image, knowledge, brand loyalty, brand quality and customer value measured through the opinions of tourists in the TripAdvisor virtual community. This study shows that customers can be extraordinary allies in publicizing a new product or service through the posts they publish, in which they openly inform and give their opinions with the intention of sharing their experience with other Internet users.

Another significant contribution comes from López Fierro and Pacheco Villamar (2021), where they perform a quantification of the opinions expressed in tweets during the Ecuadorian Presidential Elections in 2021, using sentiment analysis. This research not only highlights the flexibility of natural

language processing techniques, such as topic modeling and sentiment analysis, but also emphasizes their importance in the study of sociopolitical issues.

Busón Buesa (2020), on the other hand, explores the applications of sentiment analysis in audiovisual content available on the Internet. Based on YouTube comments from an interview with Paulo Freire, trends and patterns were identified throughout the comments from 2007 to 2019. This method not only facilitates the identification of opinion trends, but also provides a framework for understanding how perceptions evolve over time.

The contribution of Arguedas et al. (2020) focuses on exploring the opinions of Twitter users in Colombia and Costa Rica on migration, from January 1 to July 31, 2019, through a sentiment analysis approach. By approaching sentiment analysis in a general way, this study found that the main concerns of users in both countries are focused on the subcategories of human rights, security, and unemployment, providing a more holistic view of online emotional dynamics.

In Saura et al. (2018), the authors conduct a consumer-focused sentiment analysis focusing on Twitter posts that used the hashtag #BlackFriday on November 24, 2017. To determine the polarity of the analyzed tweets, data analysis algorithms implemented through Python's MonkeyLearn library were used. As a result of the study, 2204 tweets were collected, of which, 60.2 % were considered neutral, 32.1 % were classified as positive and 7.7 % as negative.

Sentiment analysis has become an essential tool in the tourism sector, allowing the strengthening of various areas within tourism entities. Through the study of visitor comments on platforms such as TripAdvisor, it has been identified that the image projected to potential customers can be affected.

Visitors' comments on TripAdvisor about their stay at Las Terrazas resort reveal a predominantly negative perception. If quick and proactive measures are not taken to solve the problems detected, this could affect profitability and make it difficult to attract new clients.

This research has laid the groundwork for future studies, contributing to the improvement of tourism management at Las Terrazas touristic resort. The findings obtained not only provide a deeper understanding of the current dynamics of tourism in this area, but also identify key areas that require attention and improvement.

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### **Conflict of interest**

Authors declare that they have no conflicts of interest.

### **Authors' contribution**

*Jorge Félix Quintana Cala and Sandro Felipe Acosta Mesa* designed the study, analyzed the data and prepared the draft.

*Emilio Enrique Guerra Castellón and Yasser Vázquez Alfonso* were involved in data collection, analysis and interpretation.

All the authors reviewed the writing of the manuscript and approved the version finally submitted.



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