Software Requirements Specification

for

Sentimental Analysis  
for Hotel Review

**Version 1.0 approved**

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Revision History

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| **Name** | **Date** | **Reason For Changes** | **Version** |
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# Introduction

## Purpose

The purpose of sentiment analysis of hotel reviews is to understand the overall sentiment of guests towards a hotel, its services, and its amenities. This information can be used by hotels to improve their guest experience, identify areas for improvement, and make better business decisions.

In sentiment analysis of hotel reviews can help hotels to:

* Understand what guests like and dislike about their hotel
* Identify areas where they can improve the guest experience
* Make better business decisions, such as how to price their rooms and what amenities to offer

Sentiment analysis is a valuable tool for hotels that want to stay ahead of the competition and provide their guests with the best possible experience.

## Document Conventions

This Document was created based on the IEEE template for System Requirement Specification Documents.

* Main heading: Times New Roman, 16 size , Bold
* Sub-heading: Times New Roman, 14 size , Bold
* Writing: Times New Roman, 12 size

## Intended Audience and Reading Suggestions

The intended audience for sentimental analysis of hotel reviews is anyone who is interested in understanding the overall sentiment of guests towards a hotel, its services, and its amenities. This includes:

* **Hotels:** Hotels can use sentiment analysis to improve the guest experience, identify areas for improvement, and make better business decisions.
* **Hotel guests:** Hotel guests can use sentiment analysis to learn more about the hotel they are considering staying at and to identify any potential problems before they book.
* **Researchers:** Researchers can use sentiment analysis to study the hotel industry, guest behavior, and customer satisfaction.
* **Investors:** Investors can use sentiment analysis to assess the financial health of a hotel and to identify investment opportunities.

Here are some reading suggestions for learning more about sentimental analysis of hotel reviews:

* **Research papers:** There are a number of research papers that have been published on the topic of sentimental analysis of hotel reviews. Some of these papers can be found on the websites of academic journals and conferences.
* **Blog posts:** There are also a number of blog posts that have been written about sentimental analysis of hotel reviews. These blog posts can be found on the websites of hotels, travel websites, and technology companies.
* **Books:** There are a few books that have been written about sentimental analysis in general. However, there are not currently any books that are specifically focused on sentimental analysis of hotel reviews.

## Product Scope

The project scope of sentimental analysis of hotel reviews will vary depending on the specific requirements of the project. However, some common elements of the project scope include:

* **Data collection:** The project will need to collect a dataset of hotel reviews. This can be done by scraping reviews from travel websites or by partnering with hotels to get access to their guest reviews.
* **Data cleaning and preprocessing:** Once the data has been collected, it will need to be cleaned and preprocessed. This may involve removing noise from the data, correcting spelling errors, and normalizing the text.
* **Feature engineering:** The project will need to identify the features that will be used to train the sentiment analysis model. This may include features such as the words used in the review, the context of the sentences, and the overall tone of the review.
* **Model training and evaluation:** The sentiment analysis model will need to be trained on the dataset of hotel reviews. Once the model has been trained, it will need to be evaluated on a held-out test set to assess its performance.
* **Deployment:** Once the sentiment analysis model has been trained and evaluated, it will need to be deployed to production so that it can be used to analyze new hotel reviews.

## References

1. [https://www.kaggle.com/code/omkarsabnis/sentiment-analysis-on-the-yelp-reviewsdataset/input](https://www.kaggle.com/code/omkarsabnis/sentiment-analysis-on-the-yelp-reviews%02dataset/inpu)
2. <https://10xds.com/blog/sentiment-analysis-of-hotel-reviews/>
3. [https://www.irjmets.com/uploadedfiles/paper//issue\_3\_march\_2023/34902/final/fin\_irjmets1680022326.pdf](https://www.irjmets.com/uploadedfiles/paper/issue_3_march_2023/34902/final/fin_irjmets1680022326.pdf)
4. <https://www.aaai.org/Papers/ICML/2003/ICML03-081.pdf>

# Overall Description

## Product Perspective

The project perspective of sentimental analysis of hotel reviews is to develop a system that can help hotels to understand and improve the guest experience. The system should be able to identify the sentiment of hotel reviews, such as positive, negative, or neutral. It should also be able to identify the specific aspects of the hotel experience that guests are praising or criticizing.

The system should be easy to use and affordable for hotels of all sizes. It should also be scalable to handle large volumes of hotel reviews.

The system can be used by hotels in a variety of ways. For example, hotels can use the system to:

* Identify areas where they are excelling and areas where they need to improve.
* Track changes in guest sentiment over time.
* Benchmark their performance against their competitors.
* Develop targeted marketing campaigns.
* Provide guests with personalized feedback.

Overall, the project perspective of sentimental analysis of hotel reviews is to develop a system that can help hotels to improve the guest experience and increase their profitability.

## Product Functions

* The product function of sentimental analysis of hotel reviews is to help hotels understand the sentiment of their guests, identify areas for improvement, and make better business decisions.
* The product can be used to analyze hotel reviews from a variety of sources, including travel websites, social media, and the hotel's own website.
* The product typically works by using machine learning algorithms to identify the sentiment of each review. The algorithms are trained on a large dataset of labeled reviews, which means that the algorithms know whether each review is positive, negative, or neutral. Once the algorithms are trained, they can be used to analyze new reviews and identify the sentiment of each review.
* In addition to identifying the sentiment of each review, the product can also identify the specific aspects of the hotel experience that guests are praising or criticizing. This information can be used by hotels to identify areas where they are excelling and areas where they need to improve.
* The product can also be used to track changes in guest sentiment over time. This information can be used by hotels to identify trends and to make necessary adjustments. For example, if a hotel sees a sudden increase in negative reviews about its staff, the hotel can investigate the issue and take steps to address it.
* The product can also be used to benchmark a hotel's performance against its competitors. This information can be used by hotels to identify areas where they need to improve in order to stay competitive.

## User Classes and Characteristic

The user classes and characteristics of sentimental analysis of hotel reviews can be broadly divided into two groups:

**1. Hotels**

**Characteristics:** Hotels are interested in using sentimental analysis to understand their guests better, identify areas for improvement, and make better business decisions.

**Use cases:** Hotels can use sentimental analysis to:

* Identify the most common complaints from guests and take steps to address them.
* Track changes in guest sentiment over time and identify trends.
* Benchmark their performance against their competitors.
* Develop targeted marketing campaigns.
* Provide guests with personalized feedback.

**2. Travelers**

**Characteristics:** Travelers are interested in using sentimental analysis to learn more about the hotels they are considering staying at and to identify any potential problems before they book.

**Use cases:** Travelers can use sentimental analysis to:

* Read reviews from other guests and get a sense of the overall sentiment towards the hotel.
* Identify the specific aspects of the hotel experience that guests are praising or criticizing.
* Compare the sentiment of reviews for different hotels.
* Avoid hotels with a lot of negative reviews.

In addition to these two main user classes, there are a number of other user classes who may be interested in using sentimental analysis of hotel reviews, such as:

**Investors:** Investors may use sentimental analysis to assess the financial health of a hotel and to identify investment opportunities.

**Researchers:** Researchers may use sentimental analysis to study the hotel industry, guest behavior, and customer satisfaction.

**Marketing agencies:** Marketing agencies may use sentimental analysis to help their clients develop more effective marketing campaigns.

## Operating Environment

**Operating system: -** Any Windows Operating System

**System Language: -** Python

**Software: -** Jupyter or Google collab

## Assumptions and Dependencies

Sentiment analysis of hotel reviews is a powerful tool, but it is important to be aware of the assumptions and dependences of the technology before using it.

**Assumptions**

* **Sentiment analysis models are trained on data:** Sentiment analysis models are trained on a large dataset of labeled reviews, which means that the models know whether each review is positive, negative, or neutral. The quality of the sentiment analysis model will depend on the quality of the training data.
* **Language is consistent:** Sentiment analysis models are trained on data in a specific language. If the model is used to analyze reviews in a different language, the results may be inaccurate.
* **Context is important:** Sentiment analysis models can be more accurate if they are able to understand the context of the review. For example, a review that says "The hotel was great, but the bed was uncomfortable" should be classified as a positive review, even though it mentions a negative aspect of the hotel experience.

**Dependences**

* **Sentiment analysis models require computing power:** Sentiment analysis models can be computationally expensive to train and run. This means that users may need to have access to a powerful computer or cloud computing platform in order to use sentiment analysis tools.
* **Sentiment analysis models require data:** Sentiment analysis models need to be trained on a large dataset of labeled reviews. This data can be collected from a variety of sources, such as travel websites, social media, and the hotel's own website.

# External Interface Requirements

## User Interfaces

User interfaces for sentimental analysis of hotel reviews can be designed in a variety of ways. However, some common features include:

* **Text input:** Users should be able to input the text of a hotel review into the system.
* **Sentiment analysis:** The system should be able to analyze the sentiment of the review and identify whether it is positive, negative, or neutral.
* **Visualization:** The system should provide users with a visualization of the results of the sentiment analysis. This could be a simple bar chart showing the percentage of positive, negative, and neutral reviews, or it could be a more complex visualization that shows the sentiment of the reviews for different aspects of the hotel experience, such as the rooms, the staff, and the amenities.

## Hardware Interfaces

* Windows
* A browser which supports CGI, HTML & Javascript.

## Software Interfaces

The question posted by user and replies in this webapp gets stored in database. Database contains the count of the the replies,views on a particular post.

## Use case Diagram

# System Features

The system features of a sentimental analysis of hotel review system can vary depending on the specific needs of the users. However, some common features include:

## Data collection and preprocessing

* The system should be able to collect hotel reviews from a variety of sources, such as hotel websites, travel websites, and social media platforms.
* The system should also be able to preprocess the data to clean and normalize the text.

## Sentiment analysis:

* The system should be able to identify the sentiment of hotel reviews, such as positive, negative, or neutral.
* The system should also be able to identify the specific aspects of the hotel experience that guests are praising or criticizing.

## Visualization:

* The system should be able to visualize the results of the sentiment analysis in a variety of ways, such as bar charts, pie charts, and word clouds.
* This will help users to quickly and easily understand the overall sentiment of the reviews and to identify any areas where the hotel needs to improve.

## Filtering and search:

* The system should allow users to filter and search the results of the sentiment analysis. For example, users should be able to filter the results by date, by rating, or by aspect of the hotel experience.
* Users should also be able to search the results for specific keywords.

## Export:

* The system should allow users to export the results of the sentiment analysis to a variety of formats, such as CSV, PDF, or Excel.
* This will allow users to further analyze the results and to share them with others.

In addition to these core features, a sentimental analysis of hotel review system may also include other features such as:

* **Trend analysis:** The system may be able to track changes in guest sentiment over time. This can help hotels to identify trends and to make necessary adjustments.
* **Benchmarking:** The system may allow hotels to benchmark their performance against their competitors. This can help hotels to identify areas where they need to improve.
* **Customizable reports:** The system may allow hotels to customize the reports that they receive. This will help hotels to get the information that they need in the format that they want.
* **Integrations:** The system may be able to integrate with other systems that hotels use, such as their property management system (PMS) or their customer relationship management (CRM) system. This can help hotels to streamline their operations and to get the most out of the system.

The specific system features that are most important will depend on the needs of the users. For example, hotels may be more interested in features that allow them to track trends in guest sentiment over time and to benchmark their performance against their competitors. Travelers may be more interested in features that allow them to learn more about the hotels they are considering staying at and to identify any potential problems before they book.

Overall, a sentimental analysis of hotel review system can be a valuable tool for both hotels and travelers. By providing insights into guest sentiment, the system can help hotels to improve the guest experience and make better business decisions. The system can also help travelers to make more informed decisions about where to stay.

# Other Nonfunctional Requirements

## Performance Requirements

The performance requirements of a sentimental analysis of hotel review system will vary depending on the specific needs of the users. However, some common performance requirements include:

* **Accuracy:** The system should be able to accurately identify the sentiment of hotel reviews. This means that the system should be able to distinguish between positive, negative, and neutral reviews with a high degree of accuracy.
* **Speed:** The system should be able to analyze hotel reviews quickly. This is important for hotels, which need to be able to get feedback from their guests quickly so that they can address any issues that are identified.
* **Scalability:** The system should be able to scale to handle large volumes of hotel reviews. This is important for large hotel chains and travel websites, which receive a large number of reviews each day.
* **Ease of use:** The system should be easy to use for both hotels and travelers. This means that the system should have a user-friendly interface and that it should be easy to understand the results of the sentiment analysis.

Overall, a sentimental analysis of hotel review system should be able to meet the performance requirements of its users. By providing accurate, fast, and scalable sentiment analysis, the system can help hotels to improve the guest experience and make better business decisions. The system can also help travelers to make more informed decisions about where to stay.

## Safety Requirements

The safety requirements of a sentimental analysis of hotel review system will vary depending on the specific needs of the users. However, some common safety requirements include:

* **Data security:** The system should protect the privacy of guest reviews. This means that the system should encrypt the data and store it in a secure location. The system should also have strong authentication and authorization controls to prevent unauthorized access to the data.
* **Bias mitigation:** The system should be designed to mitigate bias. This means that the system should be trained on a diverse dataset of reviews and that it should be able to identify and correct for bias in the data.
* **Transparency:** The system should be transparent about how it works. This means that the system should provide users with information about how the sentiment analysis is performed and how the results are interpreted.

## Security Requirements

The security requirements of a sentimental analysis of hotel review system will vary depending on the specific needs of the users and the specific implementation of the system. However, some common security requirements include:

* **Data encryption:** All data, including hotel reviews, should be encrypted at rest and in transit. This will help to protect the data from unauthorized access, even if the system is compromised.
* **Access control:** The system should have strong access control measures in place to prevent unauthorized users from accessing the data. This may include using strong passwords, multi-factor authentication, and role-based access control.
* **Audit logging:** The system should log all activity, including user logins, file access, and data changes. This will help to track any suspicious activity and to identify the source of any security breaches.
* **Vulnerability scanning:** The system should be regularly scanned for vulnerabilities. This will help to identify any security weaknesses that can be exploited by attackers.

## Software Quality Attributes

The following software quality attributes are important for a sentimental analysis of hotel review system:

* **Accuracy:** The system should be able to accurately identify the sentiment of hotel reviews. This means that the system should be able to distinguish between positive, negative, and neutral reviews with a high degree of accuracy.
* **Performance:** The system should be able to analyze hotel reviews quickly. This is important for hotels, which need to be able to get feedback from their guests quickly so that they can address any issues that are identified.
* **Scalability:** The system should be able to scale to handle large volumes of hotel reviews. This is important for large hotel chains and travel websites, which receive a large number of reviews each day.
* **Ease of use:** The system should be easy to use for both hotels and travelers. This means that the system should have a user-friendly interface and that it should be easy to understand the results of the sentiment analysis.
* **Security:** The system should protect the privacy of guest reviews. This means that the system should encrypt the data and store it in a secure location. The system should also have strong authentication and authorization controls to prevent unauthorized access to the data.

## Business Rules

Business rules for a sentimental analysis of hotel review system:

* **Identify the sentiment of each review.** The system should be able to accurately identify the sentiment of each review as positive, negative, or neutral.
* **Identify the aspects of the hotel experience that guests are praising or criticizing.** The system should be able to identify the specific aspects of the hotel experience that guests are praising or criticizing in their reviews.
* **Track changes in guest sentiment over time.** The system should be able to track changes in guest sentiment over time so that hotels can identify trends and make necessary adjustments.
* **Benchmark the hotel's performance against its competitors.** The system should be able to benchmark the hotel's performance against its competitors so that hotels can identify areas where they need to improve.
* **Develop targeted marketing campaigns.** The system should be used to develop targeted marketing campaigns based on the specific aspects of the hotel experience that guests are praising or criticizing.
* **Provide guests with personalized feedback.** The system should be used to provide guests with personalized feedback based on their reviews.

# Other Requirements

Other requirements that may be important for a sentimental analysis of hotel review system are :

* **Multilingual support:** If the hotel or travel website receives reviews in multiple languages, the system should be able to analyze reviews in those languages. This will help the hotel or travel website to get a complete picture of guest sentiment.
* **Domain knowledge:** The system should have some domain knowledge about the hotel industry. This will help the system to better understand the context of the reviews and to identify the specific aspects of the hotel experience that guests are praising or criticizing.
* **Explain ability:** The system should be able to explain why it made a particular classification. This will help users to understand the system's reasoning and to trust the results of the analysis.
* **Fairness:** The system should be fair and should not discriminate against any particular group of people. This means that the system should be able to accurately identify the sentiment of reviews from people of all different backgrounds.

**Appendix A: Glossary**

*<Define all the terms necessary to properly interpret the SRS, including acronyms and abbreviations. You may wish to build a separate glossary that spans multiple projects or the entire organization, and just include terms specific to a single project in each SRS.>*

**Appendix B: Analysis Models**

*<Optionally, include any pertinent analysis models, such as data flow diagrams, class diagrams, state-transition diagrams, or entity-relationship diagrams*.>

**Appendix C: To Be Determined List**

*<Collect a numbered list of the TBD (to be determined) references that remain in the SRS so they can be tracked to closure.>*