

## SENTIMENT ANALYSIS MODEL FOR EVALUATING SERVICE QUALITY BASED ON USER REVIEWS ON TOURISM PLATFORMS

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**Abstract:** *The rapid development of online tourism platforms has transformed the way travelers select destinations, accommodations, and tourism services. User-generated reviews on platforms such as TripAdvisor, Booking.com, Airbnb, and Google Reviews provide valuable insights into customer experiences and service quality. Traditional methods of evaluating service quality often rely on surveys and questionnaires, which may be time-consuming and limited in scope. Sentiment analysis, a branch of Natural Language Processing (NLP), offers an effective approach to automatically extract opinions and emotions from textual reviews. This study proposes a sentiment analysis model for evaluating tourism service quality based on user reviews. The model utilizes machine learning and NLP techniques to classify customer sentiments and identify key factors influencing customer satisfaction. The findings demonstrate the potential of sentiment analysis in improving tourism service management and enhancing customer experience.*

**Keywords:** *Sentiment Analysis, Tourism Platforms, Service Quality Evaluation, Natural Language Processing, Machine Learning, User Reviews.*

## Introduction

The tourism industry has experienced significant digital transformation in recent years. Online tourism platforms have become primary sources of information for travelers seeking accommodations, transportation, attractions, and other tourism-related services. User reviews posted on these platforms influence purchasing decisions and shape the reputation of tourism businesses.

Service quality is a critical determinant of customer satisfaction and business success in the tourism sector. However, the increasing volume of online reviews makes manual analysis impractical. Consequently, automated sentiment analysis has emerged as a valuable tool for understanding customer perceptions and evaluating service quality.

This study aims to develop a sentiment analysis model that evaluates tourism service quality by analyzing user-generated reviews. The proposed model enables tourism stakeholders to identify strengths and weaknesses in service delivery and make data-driven decisions.

## Literature Review

Previous studies have highlighted the importance of online reviews in tourism decision-making. Xiang and Gretzel (2010) emphasized the growing role of social media and user-generated content in travel planning. Hu, Pavlou, and Zhang (2017) demonstrated that customer reviews significantly affect hotel booking intentions.

Sentiment analysis has been widely applied in tourism research. Kirilenko et al. (2018) utilized sentiment analysis to examine tourists' perceptions of destinations. Zhang et al. (2021) employed machine learning algorithms to classify hotel reviews and predict customer satisfaction levels.

Recent advancements in deep learning, including Long Short-Term Memory (LSTM) networks and Bidirectional Encoder Representations from Transformers (BERT), have substantially improved sentiment classification accuracy. These approaches enable more sophisticated understanding of contextual meanings and emotional expressions in textual data.

## **Research Methodology**

### **Data Collection**

The dataset consists of user reviews collected from major tourism platforms, including:

- TripAdvisor
- Booking.com
- Airbnb
- Google Reviews

Reviews were selected from hotels, restaurants, tour operators, and tourist attractions. The dataset includes review text, ratings, review dates, and service categories.

### **Data Preprocessing**

Data preprocessing involves several steps:

1. Text cleaning
2. Tokenization
3. Stop-word removal
4. Lemmatization
5. Feature extraction

Special characters, URLs, and irrelevant symbols are removed to improve text quality.

## Sentiment Classification

The proposed model categorizes reviews into three sentiment classes:

- Positive
- Neutral
- Negative

Machine learning algorithms such as Support Vector Machines (SVM), Random Forest, and BERT-based models are employed to classify sentiments.

### 3.4 Service Quality Dimensions

The analysis focuses on several service quality dimensions:

- Staff behavior
- Cleanliness
- Comfort
- Location
- Price-value ratio
- Food quality
- Customer support

Aspect-based sentiment analysis is applied to determine customer opinions regarding each dimension.

### Proposed Sentiment Analysis Model

The proposed model consists of five stages:

#### Stage 1: Data Acquisition

Reviews are collected through platform APIs and web scraping techniques.

#### Stage 2: Data Preprocessing

Raw textual data undergoes cleaning and normalization.

#### Stage 3: Feature Extraction

Textual features are extracted using:

- TF-IDF
- Word Embeddings
- BERT Embeddings

#### **Stage 4: Sentiment Classification**

The classification model predicts sentiment polarity for each review.

#### **Stage 5: Service Quality Evaluation**

Sentiment scores are aggregated to generate an overall service quality index.

The service quality score can be calculated as follows:

$$SQI = (P - N) / T$$

Where:

- SQI = Service Quality Index
- P = Number of positive reviews
- N = Number of negative reviews
- T = Total number of reviews

A higher SQI indicates better perceived service quality.

### **Results and Discussion**

The implementation of the proposed model demonstrates several advantages:

- Automated analysis of large review datasets
- Real-time monitoring of customer satisfaction
- Identification of recurring service issues
- Enhanced decision-making for tourism managers

Experimental results indicate that BERT-based models achieve higher classification accuracy compared to traditional machine learning approaches. The model effectively identifies customer sentiments related to specific service dimensions and provides actionable insights.

For example, analysis of hotel reviews revealed that cleanliness and staff behavior were the most influential factors affecting customer satisfaction. Negative reviews frequently highlighted issues related to room maintenance and delayed customer support.

### **Practical Implications**

Tourism businesses can utilize sentiment analysis systems to:

- Monitor customer feedback continuously
- Improve service quality management
- Detect emerging problems early
- Enhance customer loyalty
- Strengthen online reputation

Government tourism agencies may also employ sentiment analysis to evaluate destination competitiveness and tourist satisfaction levels.

### **Conclusion**

This study proposes a sentiment analysis model for evaluating tourism service quality based on user reviews from online tourism platforms. By integrating Natural Language Processing and machine learning techniques, the model provides an efficient and scalable approach to understanding customer perceptions. The findings demonstrate that sentiment analysis can serve as a valuable tool for tourism stakeholders seeking to improve service quality and customer experience.

Future research may explore multilingual sentiment analysis, cross-cultural differences in tourist perceptions, and the integration of deep learning techniques for enhanced performance.

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