

# Assignment Title : High Enough? Explaining and Predicting Traveler Satisfaction Using Airline Reviews

CSE-0410 Summer 2021

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**Abstract**—Main theme of our assignment or academic project is "High Enough? Explaining and Predicting Traveler Satisfaction Using Airline Reviews".

**Index Terms**—Explaining and Predicting Traveler Satisfaction Using Airline Reviews.

## I. INTRODUCTION

In the last decades, air travel has become one of the most frequently used means of transportation. The International Air Transport Association (IATA) expects traveler numbers to reach 7.3 billion by 2034, representing a 4.1% annual growth rate [1]. At the same time, an increasing number of airlines is competing for market shares, which raises the need to attract customers while balancing costs and services. To identify which review features are most indicative for traveler satisfaction, we conduct a feature analysis in which we correlate rating and the inferred sentiment with the overall rating given by the user. We find that airport queuing time, lounge comfort, airline cabin staff quality and seat legroom space are factors that highly impact the overall traveler satisfaction. We also find that the sentiment of the review content is a good indicator to determine whether a traveler was satisfied with the travel. Additionally, we perform clustering and cluster labelling of the textual content in order to identify topics, which are discussed in the reviews. In the long run, this may help to extend the rating schema. For example, if many users discuss the topic "immigration" in their textual review, the rating portal could introduce a novel rating feature, which enables users to rate the quality of the immigration service.

## II. THE PURPOSE OF CHOOSING THIS TOPIC:

Explaining and uncover the features of airline reviews that contribute most to traveler satisfaction and also examine reviews crawled from the Skytrax air travel review portal. Dedicated to improving the Customer Experience for airlines and airports across the world, Skytrax deliver unique knowledge, expertise and innovative thinking to help make change happen. Skytrax are specialist Research and Quality Advisors to the air transport industry.

## III. RELATED WORK

Nowadays, online reviews are getting more popular and as a consequence, there is the opportunity to leverage them as a rich and powerful source of information. In fact, there is a lot of valuable hidden information available in online reviews [12]. As such, Web sites like the already mentioned Skytrax portal, AirlineRatings 2 and TripAdvisor 3 are important for the airline industry to study how service quality is perceived by the travelers. In our work, we perform a comprehensive feature analysis using rating features and inferred sentiment from airport, lounge, airline and seat reviews in order to explain which features actually contribute to traveler satisfaction. Moreover, we show how these features can be utilized to predict traveler satisfaction.

## IV. LITERATURE REVIEW

### Customer Experience, Satisfaction and Online Review

Customer satisfaction is a complex customer experience in the service industry, and can be defined as an evaluation on which the customers have experienced. Understanding what consumers expect from a service industry is important in order to provide a standard of comparison against which consumers judge an organization's performance regarding the expectation. Service quality can be defined as a consumer's overall impression of the relative efficiency of the organization. In addition, customer satisfaction can be defined as experience made on the basis of a specific service encounter, and it is contributed to customer loyalty, repeat purchase, favorable word-of-mouth (WOM), and ultimately higher profitability. The customer sets expectations for the product or service and these expectations are becoming the standard before purchasing. Once the product or service is used, the outcomes or perceptions are compared to pre-purchase expectations. Consumer generated content contains a variety of media forms and types. Online reviews that reflect how customers explain and share their experiences in various forms are a valuable way of figuring out what customers think, and online platforms allow customers to share experience with information, opinions, and knowledge about products, services and brands.

Customers seek out a variety of information to be confident of their choices, thereby reducing the perceived risk. Therefore, in this study, data was collected through the online review written by those who have already experienced it. Due to the advance of technology, it is easy for customers to post their experience with products and services on the website . It is especially relevant for service industries because of intangible characteristics of services. Many studies have demonstrated the strong impact of online customer reviews. For example, Dellarocas et al. have demonstrated that online review metrics can accurately forecast movie revenue. Minnema et al. have demonstrated that product returns have a strong relationship with online customer reviews and the effect of it needs to be considered. The number of reviews has grown exponentially over the past few decades, and the content of the reviews has had a significant impact on the repurchase of products. Sotiriadis and van Zyl found that online reviews and recommendations affect the decision making process of tourists towards tourism services and WOM has a significant impact on the subjective norms and attitudes towards an airline, and a customer's willingness to recommend. Therefore, the online review would be very useful for airlines to understand their diverse customer base in order to take service improvement strategies since airlines are inherently multicultural businesses

## V. AIRLINE REVIEW DATA

Airport Star Rating applies quality assessment across all customer-facing items of product and service that an airport provides.Skytrax COVID-19 Airport Safety Rating is a trusted assessment and certification of airport hygiene and safety measures during the coronavirus pandemic, based on detailed and professional investigation of actual standards being provided at the airport.

The COVID-19 Safety Accreditation is regarded as a global benchmark for defining safe travel assurance for customers by complex analysis of the hygiene improvement procedures and systems introduced by airport during the coronavirus pandemic. The COVID-19 Safety Audit investigates over 175 safety protocols introduced by airports during COVID-19 to enhance customer and staff safety, and evaluates the airport's implementation of health, hygiene and safety measures in accordance with the recommendations of the ICAO Council's Aviation Recovery Task Force and the European Union Aviation Safety Agency (EASA) and European Centre for Disease Prevention and Control (ECDC) Aviation Health Safety Protocol.

## VI. EXPLAINING TRAVELER SATISFACTION

The customer sets expectations for the product or service and these expectations are becoming the standard before purchasing. Once the product or service is used, the outcomes or perceptions are compared to pre-purchase expectations. Consumer generated content contains a variety of media forms and types . Online reviews that reflect how customers explain and share their experiences in various forms are a valuable

way of figuring out what customers think, and online platforms allow customers to share experience with information, opinions, and knowledge about products, services and brands . Customers seek out a variety of information to be confident of their choices, thereby reducing the perceived risk . Therefore, in this study, data was collected through the online review written by those who have already experienced it. Due to the advance of technology, it is easy for customers to post their experience with products and services on the website . It is especially relevant for service industries because of intangible characteristics of services. Many studies have demonstrated the strong impact of online customer reviews. For example, Dellarocas et al. have demonstrated that online review metrics can accurately forecast movie revenue. Minnema et al. have demonstrated that product returns have a strong relationship with online customer reviews and the effect of it needs to be considered. The number of reviews has grown exponentially over the past few decades, and the content of the reviews has had a significant impact on the repurchase of products . Sotiriadis and van Zyl found that online reviews and recommendations affect the decision making process of tourists towards tourism services and WOM has a significant impact on the subjective norms and attitudes towards an airline, and a customer's willingness to recommend. Therefore, the online review would be very useful for airlines to understand their diverse customer base in order to take service improvement strategies since airlines are inherently multicultural businesses.

## VII. ADVANTAGE OF AIRLINE REVIEWS

What to Know Before Flying any Airlines,According to Passenger Reviews? It's depend on the services of Airlines reviews and customer satisfaction . Here also included all of travel reviews.

By this reviews customer will know about:-

- 1.World's best Airlines.
- 2.The services of the airlines.
- 3.Latest airports reviews.
- 4.Customer travelling Satisfaction.
- 5.All Classes of latest lounge .
- 6.COVID safe travelling.
- 7.Ratting of all classes seats.

## VIII. DISADVANTAGE OF AIRLINE REVIEWS

While traveling sometimes traveller face negatives that are commonly associated with plane travel. It is not included with reviews,but every traveler need to know about some disadvantage of plane Travel.

They are:-

- 1.Going Through Security.
- 2.Cramped Economy Flights.
- 3.Traveler can't carry any food.
- 4.Expensive Airports.
- 5.Delays, Cancellations, and Lost Baggage.
- 6.Passports, Bureaucracy, and Luggage Collection.
- 7.Traveling To and From the Airport.
- 8.Traveler can't fixed the time schedule.
- 9.Inconsiderate and Noisy Neighbors .

## IX. CONCLUSION

In this paper, we discuss how online reviews can be an important source of information to explain and predict traveler satisfaction. We utilized data crawled from the Skytrax portal in order to show that rating features such as airport queuing time, lounge comfort, airline cabin staff quality and seat legroom size highly contribute to the overall traveler satisfaction. Moreover, we found a strong correlation between review text sentiment and the final traveler satisfaction. Based on these findings, we trained several classifiers and we report the results of the Hoeffding Tree algorithm, which not only provides strong accuracy performance but also a competitive run time. The algorithm is especially suited for real-world settings, where the goal is to continuously mine and predict traveler satisfaction using online reviews. As such, our proposed methods and findings of this work should be of interest for researchers in the area of modeling and predicting user satisfaction based on review data on the Web. To sum up, we found not only that traveler satisfaction can indeed be predicted with high accuracy but also that inferred features such as the extracted sentiment bear great potential in explaining and predicting traveler satisfaction.

## ACKNOWLEDGMENT

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**HIGH ENOUGH?  
EXPLAINING AND PREDICTING TRAVELER SATISFACTION  
USING AIRLINE REVIEWS**

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# INTRODUCTION

Air travel is one of the most frequently used means of transportation in our everyday life. In the last decades, air travel has become one of the most frequently used means of transportation.

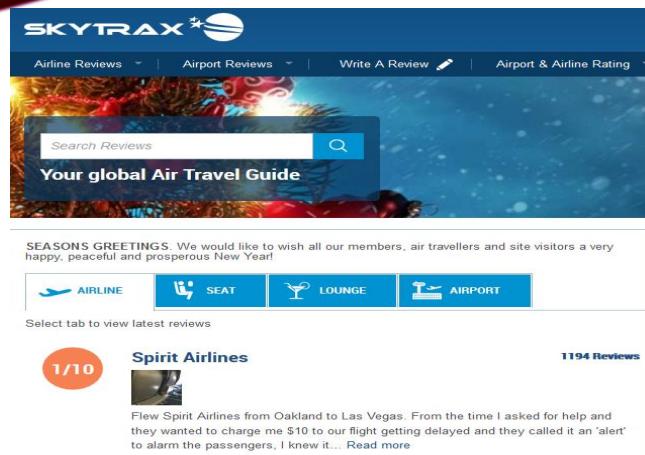
Thus, it is not surprising that an increasing number of travelers share their experiences with airlines and airports in form of online reviews on the Web. In this work, we thrive to explain and uncover the features of airline reviews that contribute most to traveler satisfaction.

Each review category consists of several five-star ratings as well as free-text review content.

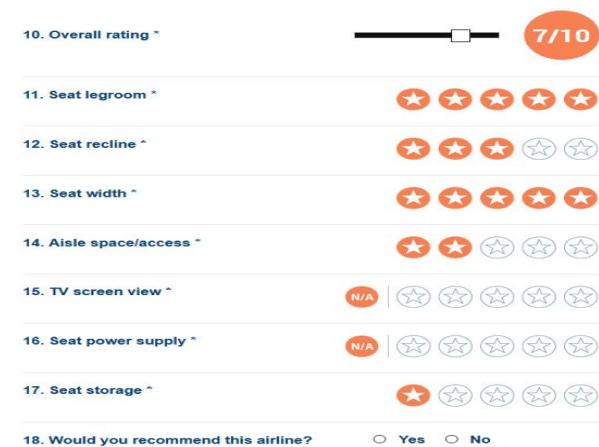
# KEYWORDS

- Airlines reviews
- Skytrax
- Traveler satisfaction
- User satisfaction prediction
- Advantage and Disadvantages
- Features analysis

# AIRLINES REVIEW



a) Reviews



b) Ratings

- ✓ RQ1: Which airline review features are most indicative for traveler satisfaction?
- ✓ RQ2: To what extent can we predict traveler satisfaction using the available rating and inferred sentiment of airline reviews?

# SKYTRAX

- ❑ Skytrax, the international air transport rating organization, was established in 1989, and is based in London, UK.
- ❑ Introduce in 1999, the world Airline and Airport Star Rating Program.

## New Update

- ❖ In August 2020, Skytrax launched the **COVID-19 safety ratings** covering airlines and airports across the world.

## **EXPLAINING TRAVELER SATISFACTION AND METHODOLOGY**

We use the overall rating to evaluate how the different review features influence the traveler's satisfaction.

- ✓ Overall scores
- ✓ Rating and inferred features with the overall ratings by user
- ✓ Reviews on Airport, Lounge, Airlines and Seat.

# REVIEWS

Airport reviews		
Feature	F1	AUC
Overall	0.963	0.948
Queuing	0.869	0.875
Airport shopping	0.859	0.876
Terminal cleanliness	0.828	0.814
Terminal seating	0.791	0.534
Food beverages	0.792	0.530
WiFi connectivity	0.774	0.519
Terminal signs	0.800	0.502
Airport staff	0.678	0.499
Combination	<b>0.967</b>	<b>0.976</b>
Airport Sentiment	0.719	0.715

Lounge reviews		
Feature	F1	AUC
Overall	0.834	0.878
Comfort	0.762	0.839
Staff service	0.768	0.819
Bar beverages	0.783	0.838
Catering	0.783	0.829
Cleanliness	0.773	0.817
Washrooms	0.750	0.826
WiFi	0.743	0.795
Combination	<b>0.837</b>	<b>0.884</b>
Lounge Sentiment	0.773	0.822

Airline reviews		
Feature	F1	AUC
Overall	0.838	0.971
Value money	<b>0.863</b>	0.940
Cabin staff	0.794	0.884
Seat comfort	0.750	0.843
Food beverages	0.741	0.827
Inflight entertainment	0.693	0.754
Ground service	0.622	0.533
WiFi connectivity	0.615	0.509
Combination	0.842	<b>0.975</b>
Airline Sentiment	0.839	0.896

Seat reviews		
Feature	F1	AUC
Overall	<b>0.939</b>	<b>0.985</b>
Seat legroom	0.872	0.919
Seat width	0.847	0.890
Aisle space	0.840	0.895
Seat recline	0.802	0.855
Viewing TV	0.730	0.759
Seat storage	0.711	0.576
Power supply	0.647	0.529
Combination	0.925	0.984
Seat Sentiment	0.812	0.849

✓ Reviews on Airport, Lounge, Airlines and Seat.

## **PREDICTING TRAVELER SATISFACTION AND METHODOLOGY:**

- Formulate the task a binary classification problem.
  - Given reviews marked as either positive or negative satisfaction.
- In this work, however, we report the results of the Hoeffding Tree.
- We chose this algorithm due to its practical advantage for real-time data mining.

# METHODOLOGY

- ✓ To determine the best performing features for traveler satisfaction prediction, we trained and evaluated the classification model in the following three settings.
  1. for each single rating feature, we created a separate classifier and evaluated its performance.
  2. we used a combination of features that highly correlate with the traveler satisfaction while having a low inter-correlation
  3. we trained a model solely based on the inferred review text sentiment.

## **ADVANTAGES OF AIRLINE REVIEWS:**

- 1. World's best Airlines.**
- 2. The services of the airlines.**
- 3. Latest airports reviews.**
- 4. Customer travelling Satisfaction.**
- 5. All Classes of latest lounge .**
- 6. COVID safe travelling.**
- 7. Rating of all classes seats.**

## **DISADVANTAGE OF AIRLINE REVIEWS:**

- 1. Going Through Security.
- 2. Cramped Economy Flights.
- 3. Traveler can't carry any food.
- 4. Expensive Airports.
- 5. Delays, Cancellations, and Lost Baggage.
- 6. Passports, Bureaucracy, and Luggage Collection.
- 7. Traveling To and From the Airport.
- 8. Traveler can't fixed the time schedule.
- 9. Inconsiderate and Noisy Neighbors .

# CONCLUSION

In this paper, we discuss how online reviews can be an important source of information to explain (RQ1) and predict (RQ2) traveler satisfaction. We utilized data crawled from the Skytrax portal in order to show that rating features such as airport queuing time, lounge comfort, airline cabin staff quality and seat legroom size highly contribute to the overall traveler satisfaction.

Based on these findings, we trained several classifiers and we report the results of the Hoeffding Tree algorithm. The algorithm is especially suited for real-world settings, where the goal is to continuously mine and predict traveler satisfaction using online reviews.



# Thank You