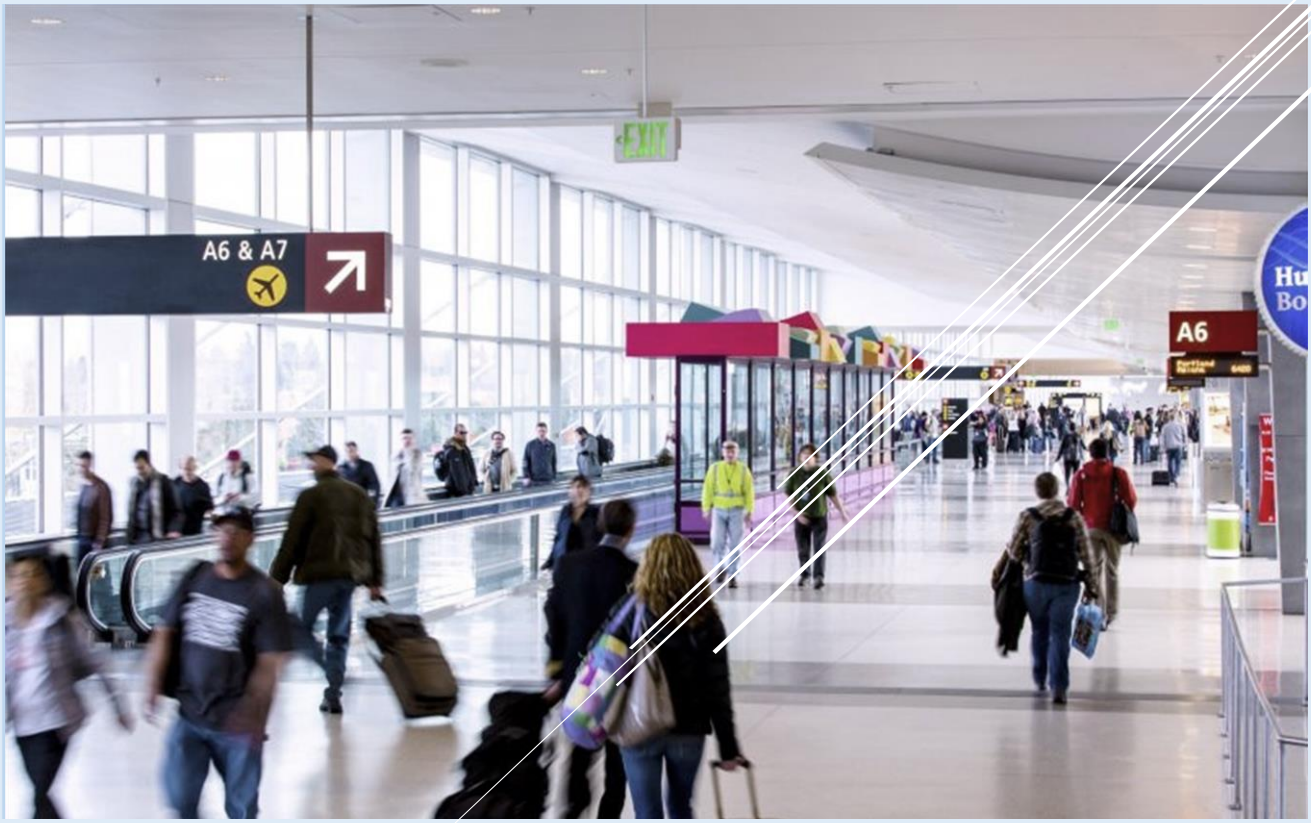

PASSENGER SATISSFACTION

Ghofran Alqarni

Contents

Proposal

Overview: Problem and Background

To achieve a long-term success, Airlines are redirecting their sights from cost containment to customer centricity. Technology and information in the hands of customers is changing the game, making it increasingly difficult to rely on brand image, market presence, or scale.

As a result, Airline should equip itself with technology that allows them to keep track of a customer's past and/or predicted preferences for sales and service interactions.

Purpose of Building Model

Building a customer-centric airline means offering passengers memorable and lasting experiences. Each customer has their own set of expectations when it comes to their interactions with airlines. Airlines have the opportunity to provide a personalized travel experience that matches or exceeds those specific expectations.

This project aims to help any airline to become a Customer-Centric Airline by predicting which flight services affect most on customer satisfaction based on passenger characteristics.

There are 3 types of services that airlines offer for passengers:

- Pre-Flight services: online booking, online boarding and onboard services
- In-Flight services: In-flight services are additional offerings, both free and paid, provided by airlines to improve their passengers' flying experience. This includes not only food, beverages and duty free shopping, but also the provision of entertainment services and internet access via Wi-Fi
- Post-Flight services: Prior to landing: meeting entrance requirements of specific countries and Disembarkation (Disarming and opening of doors, procedures for all passengers and those with specific requirements, security checks)

Which service should airlines focus on that increase the prediction of customer satisfaction? Is it Pre-Flight services, In-Flight services or Post-Flight services?

Data Description

Customer feedback survey is the best way to identify customer's experience as a unique and to differentiate customer's needs. However, due to data confidentiality in Airlines, only few datasets related to this topic are shared in public.

Dataset

"**Airline Passenger Satisfaction**" Contains US Airline passenger satisfaction survey results

Source: https://www.kaggle.com/johnddddd/customer-satisfaction

This dataset contains 24 columns and 129880 rows, each row represent a unique passenger experience, by evaluating their own journey starting from booking until arriving their destination.

Columns:

#	Name	Descriptions	Values
1	id	Passenger response ID	
2	Satisfaction_v2	Airline satisfaction level	(Satisfaction, neutral or dissatisfaction)
3	Age	The actual age of the passengers	
4	Gender	Gender of the passengers	(Female, Male)
5	Type of Travel	Purpose of the flight of the passengers	(Personal Travel, Business Travel)
6	Class	Travel class in the plane of the passengers	(Business, Eco, Eco Plus)
7	Customer Type	The customer type by loyalty	(Loyal customer, disloyal customer)
8	Flight distance	The flight distance of this journey	
9	Inflight wifi service	Satisfaction level of the inflight wifi service	(0:Not Applicable; Rating :1-5)
10	Ease of Online booking	Satisfaction level of online booking	Rating (1-5)
11	Inflight service	Satisfaction level of inflight service	Rating (1-5)
12	Online boarding	Satisfaction level of online boarding	Rating (1-5)
13	Inflight entertainment	Satisfaction level of inflight entertainment	Rating (1-5)
14	Food and drink	Satisfaction level of Food and drink	Rating (1-5)
15	Seat comfort	Satisfaction level of Seat comfort	Rating (1-5)
16	On-board service	Satisfaction level of On-board service	Rating (1-5)
17	Leg room service	Satisfaction level of Leg room service	Rating (1-5)
18	Departure/Arrival time convenient	Satisfaction level of Departure/Arrival time convenient	Rating (1-5)
19	Baggage handling	Satisfaction level of baggage handling	Rating (1-5)
20	Gate location	Satisfaction level of Gate location	Rating (1-5)
21	Cleanliness	Satisfaction level of Cleanliness	Rating (1-5)
22	Check-in service	Satisfaction level of Check-in service	Rating (1-5)
23	Departure Delay in Minutes	Minutes delayed when departure	
24	Arrival Delay in Minutes	Minutes delayed when Arrival	

As shown, this survey contains useful features for this project, However Post-Flight services features are unavailable here, we can focus to determine which (In-Flight / Pre-Flight) service that should Airline focus on:

Name	(online/offline) service
id	-
Satisfaction_v2	Our target
Age	-
Gender	-
Type of Travel	-
Class	-
Customer Type	-
Flight distance	-
Inflight wifi service	In-Flight service
Ease of Online booking	Pre-Flight service
Inflight service	In-Flight service
Online boarding	Pre-Flight service
Inflight entertainment	In-Flight service
Food and drink	In-Flight service
Seat comfort	In-Flight service
On-board service	Pre-Flight service
Leg room service	In-Flight service
Departure/Arrival time convenient	In-Flight service
Baggage handling	Pre-Flight service
Gate location	Pre-Flight service
Cleanliness	In-Flight service
Check-in service	Pre-Flight service
Departure Delay in Minutes	-
Arrival Delay in Minutes	-

Tools:

python packages for data science models libraries:

- Pandas
- Seaborn
- Sklearn
- Matplotlib

Exploratory Data Analysis

Identification of variables and Datatype

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 129880 entries, 0 to 129879
Data columns (total 24 columns):
 #   Column                            Non-Null Count   Dtype  
---  ------                            --------------   -----  
 0   id                                129880 non-null  int64  
 1   satisfaction_v2                   129880 non-null  object 
 2   Gender                            129880 non-null  object 
 3   Customer Type                     129880 non-null  object 
 4   Age                               129880 non-null  int64  
 5   Type of Travel                    129880 non-null  object 
 6   Class                             129880 non-null  object 
 7   Flight Distance                   129880 non-null  int64  
 8   Inflight wifi service             129880 non-null  int64  
 9   Departure/Arrival time convenient 129880 non-null  int64  
 10  Ease of Online booking            129880 non-null  int64  
 11  Gate location                     129880 non-null  int64  
 12  Food and drink                    129880 non-null  int64  
 13  Online boarding                   129880 non-null  int64  
 14  Seat comfort                      129880 non-null  int64  
 15  Inflight entertainment            129880 non-null  int64  
 16  On-board service                  129880 non-null  int64  
 17  Leg room service                  129880 non-null  int64  
 18  Baggage handling                  129880 non-null  int64  
 19  Checkin service                   129880 non-null  int64  
 20  Inflight service                  129880 non-null  int64  
 21  Cleanliness                       129880 non-null  int64  
 22  Departure Delay in Minutes        129880 non-null  int64  
 23  Arrival Delay in Minutes          129487 non-null  float64
dtypes: float64(1), int64(18), object(5)
memory usage: 23.8+ MB
```

Numerical variables:

Disceret

Age, Flight Distance ,Departure Delay in Minutes, Arrival Delay in Minutes

Categorical variables:

satisfaction_v2, Gender, Customer Type, Type of Travel, Class

Inflight wifi service, Departure/Arrival time convenient, Ease of Online booking,Gate location, Food and drink, Online boarding, Seat comfort, Inflight entertainment, On-board service, Leg room service,Baggage handling, Checkin service, Inflight service, Cleanliness

Ratings on a scale from 1 to 5 are Categorical ordinal variables

1:Very unsatisfied , 2:unsatisfied , 3:Neutral , 4:satisfied , 5:Very satisfied

Although these are represented by numbers, they do not represent a count or true measurement.

Target and Features:

The target value is satisfaction_v2, and the rest 23 features can be assumed as the predictor variables.

How to clean and prepare data, this will be shown later in presentation