

# San Francisco International Airport (SFO) Customer Survey

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*July 30, 2016*

## Synopsis

This is a mini-project I carried to showcase my data extraction, structuring, manipulating and visualization skills. Due to the limited dataset, I was able to perform a basic analysis using the R Programming Language and Microsoft Excel.

The goal of this report is to identify possible changes that can be implemented by American Airlines (AA) to improve the customer experience of AA customers departing from the San Francisco International Airport (SFO). The results are displayed using barplots to show customer complaints count by airline, destination and complaint type.

The current data was collected in May 2015 through interviews with 2,958 customers in each of SFO's terminals and boarding areas. Of the 1352 complaints entered into the survey, 42 complaints were raised pertaining to airlines. These airline complaints ranged from poor staffing and customer service to flight delays and poor flight change communication. AA accounted for 4 of the 42 complaints raised by airline customers in the survey. Although AA survey data is lacking, from the few entries available in this analysis, I can infer that there are staffing issues.

## Note:

### Limitations

- Without additional data on the total departing flight count, and total customers surveyed per airline, normalization to enable extensive comparison between airlines could not be carried out.
- SFO is only one of the over 80 domestic airports that AA flies to. Therefore a customer complaint survey from SFO alone might not be representative of all AA customers.
- Without additional data such as the total number of AA customers surveyed, it would be misleading to conclude that a total four AA customer complaints is significant and representative of the population of AA customers flying out of SFO.

Although the complaints raised by airline customers in the survey ranged from operational related problems such as flight delays, to technology related problems such as the absence of online baggage check-in with some airlines.

The four complaints raised by AA customers at the SFO airport were mainly personnel related problems. Low Airline Customer Service Staff, Unavailability of Check-in Staff, and Unhelpful Airline Customer Service Staff can all be categorized under personnel improvement opportunities.

### Recommendations

Assuming these complaints are significant and representative of the feelings of the population of AA customers flying out of SFO, then based on the analysis of the survey data I would recommend the following:

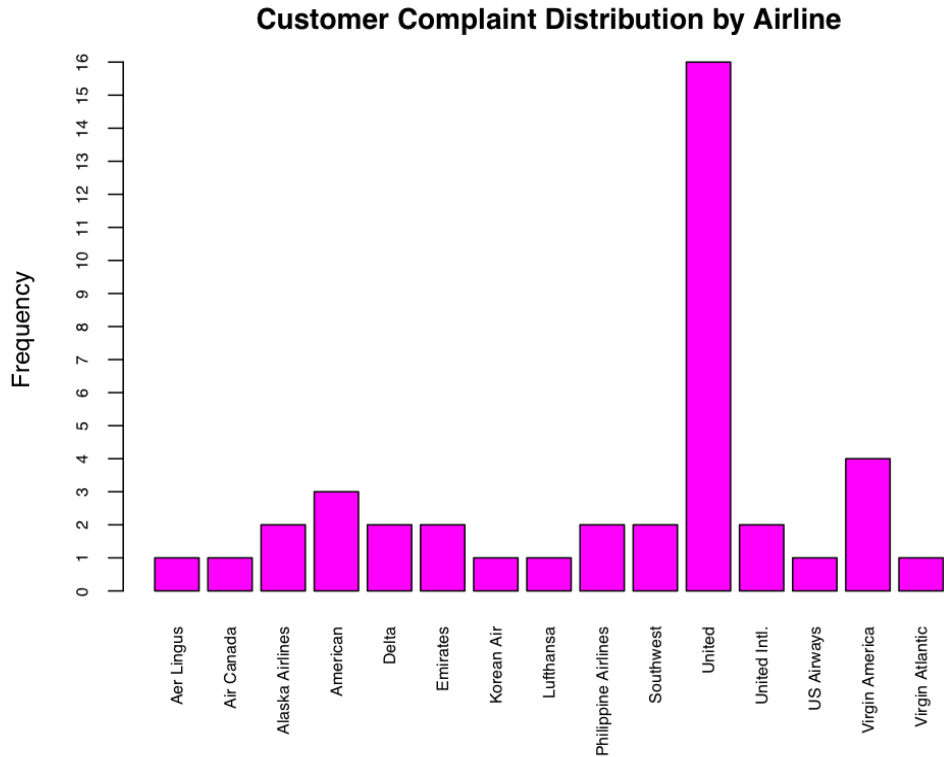
- AA addresses operational issues associated with Baggage Claim Difficulty
- Additional Customer Service Staff be added to help with customer questions and check-ins
- AA Customer Service Staff be routinely required to attend service training programs. Additionally, AA can implement a customer service rating rewards program to act as an incentive to Customer Service Staff to be serve AA customers.

## Consumer Survey Data Summary

These passenger datasets contain data pertaining to customer demographics and satisfaction with Airport facilities, services, and initiatives. The Customer Survey is conducted annually.

Data Source: <http://www.flysfo.com/media/customer-survey-data>

## Survey Data Breakdown and Analysis



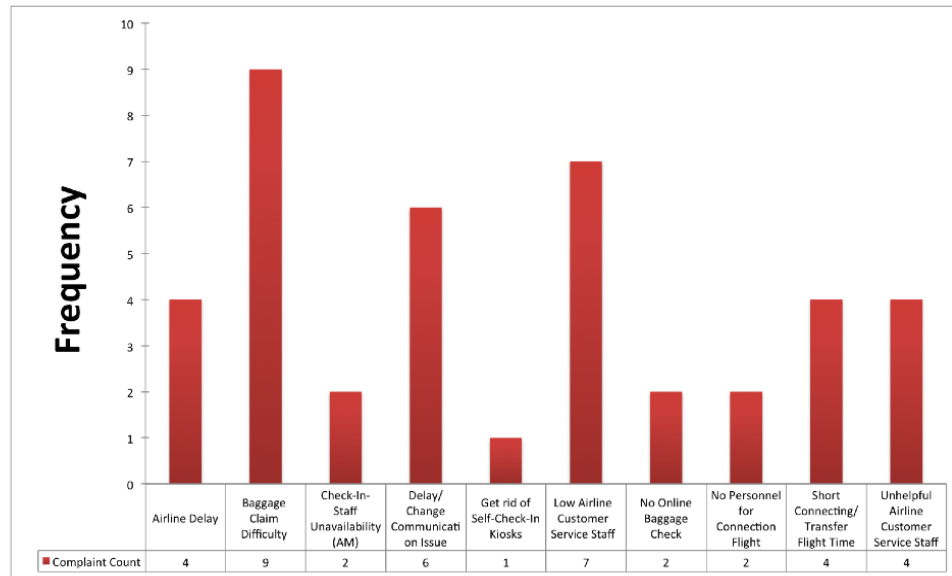
The above plot shows a distribution of customer complaints by airline departing San Francisco International Airport.

Although this chart above may lead you to infer United Airlines (UA) has the worst flight issues, we cannot conclude. The significant complaint count for UA in comparison to other airlines may have originated from UA departing flights count from SFO accounting for a large percent of all departing flights from SFO. With

departing flight count and customer size data unavailable, normalization to evaluate this dataset could not be carried out to arrive at a solid conclusion.

In addition, the chart above points out the lack of AA data from this survey.

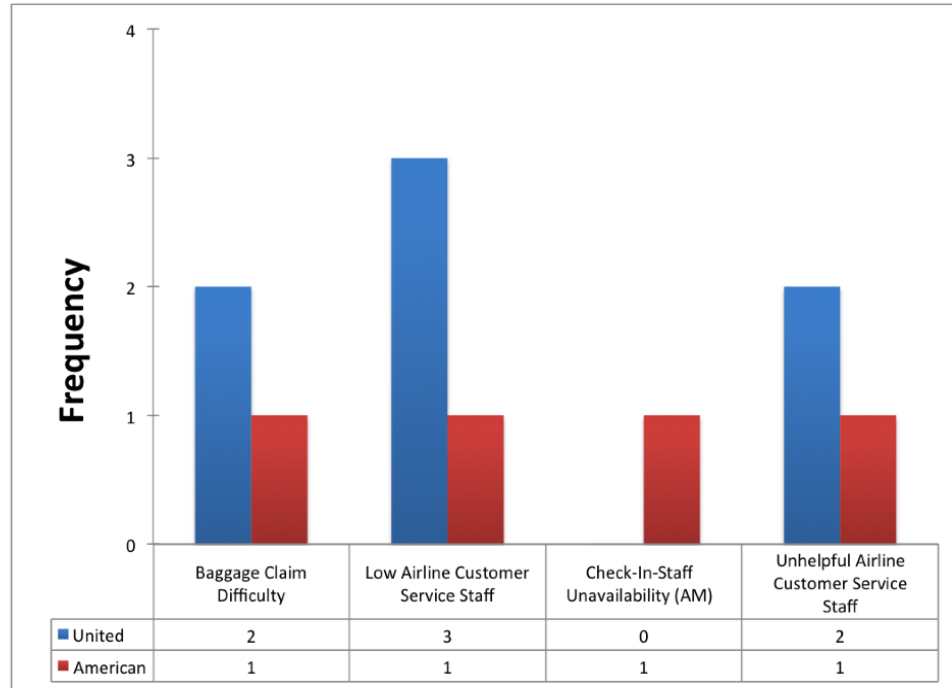
### Customer Complaint Distribution for all SFO Departing Flights



The barplot above shows the frequency of customer complaints for flights departing from San Francisco International Airport.

Chart Summary: Baggage claim issues account for ~ 22% of complaints, airline delay and communication issues account for ~ 24% of the complaints and staffing and customer issues account for ~ 32% of the complaints. Basing my conclusion solely on the survey data provided, I can conclude that those are the top 3 customer complaints from all flights departing SFO.

### Top 3 Customer Complaints Comparison: AA vs UA



To evaluate AA data further, I compared AA to UA based on complaints similarities. The chart above depicts this.

Although the chart shows AA have some lesser complaint counts than UA, issues with AA staffing and customer service in SFO need to be addressed.

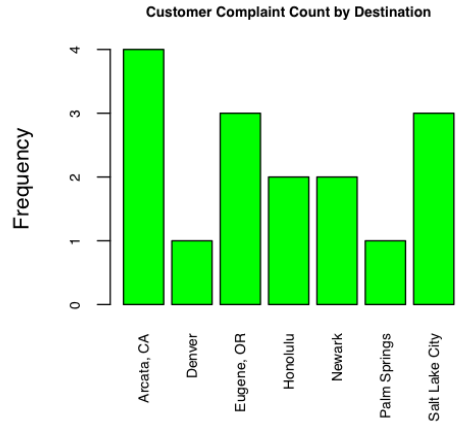
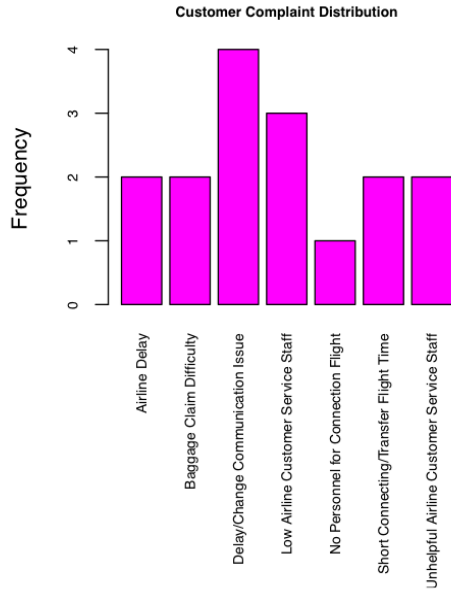
### NOTE

*With departing flight count and customer size data unavailable, normalization to evaluate comparison extensively could not be carried out. As a result, data and results may be misleading.* Since the data was not normalized, this is not an apples-to-apples comparison. Although from the above barplot you would infer that UA has a higher percentage of baggage claim complaints reported, without data on the total number of departing flights for each airline, it is impossible to conclude. For example, if UA has double the number of flights departing from SFO compared to American, the complaint comparison chart becomes an equivalent comparison.

### Additional Data Analysis

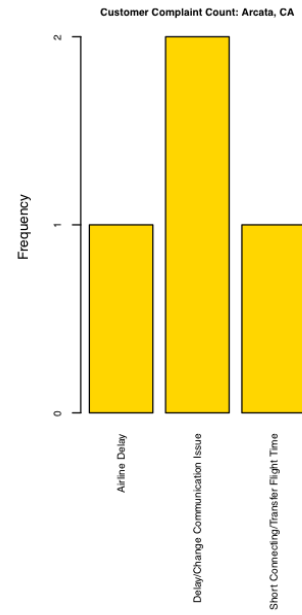
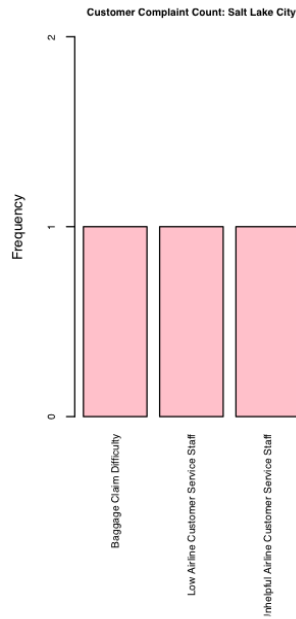
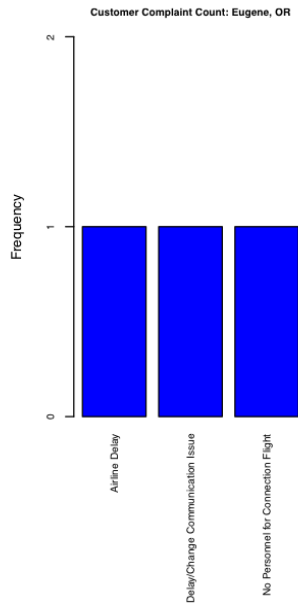
Due to a lack of AA data and for a better understanding of what can be done with this data, I will analyze UA survey data.

*(continued on next page)*



*Plots are based on United Airline survey data only*

### Customer Complaints Frequency by Flight Destination



Plot 1 (Magenta) shows the distribution of customer complaints across all UA flights departing from SFO. Plot 2 (Green) shows the frequency of customer complaints by flight destination.

This was done to show the need for data mining and exploration. Data problems can rarely be answered by a broad view of information but instead it is necessary to dig deeper and find underlying causes to problems. In this case, it could have been inferred that customer complaints are distributed evenly across flight destinations but that is not so. Arcata, CA contain just a fraction of customer complaints that vary across the distribution plot.

Plots 3, 4, & 5 (Blue, Pink & Gold) break down plot 2 for flight destination: Eugene, OR, Salt Lake City and Arcata, CA. We can infer from these plots that complaints such as “Airline Delay” and “Delay Change Communication Issue” occur frequently and such a complaint occurrence is not dependent on the flight destination.

## Appendix

### Raw Data Snippet

Below is a snapshot of the cleaned data table.

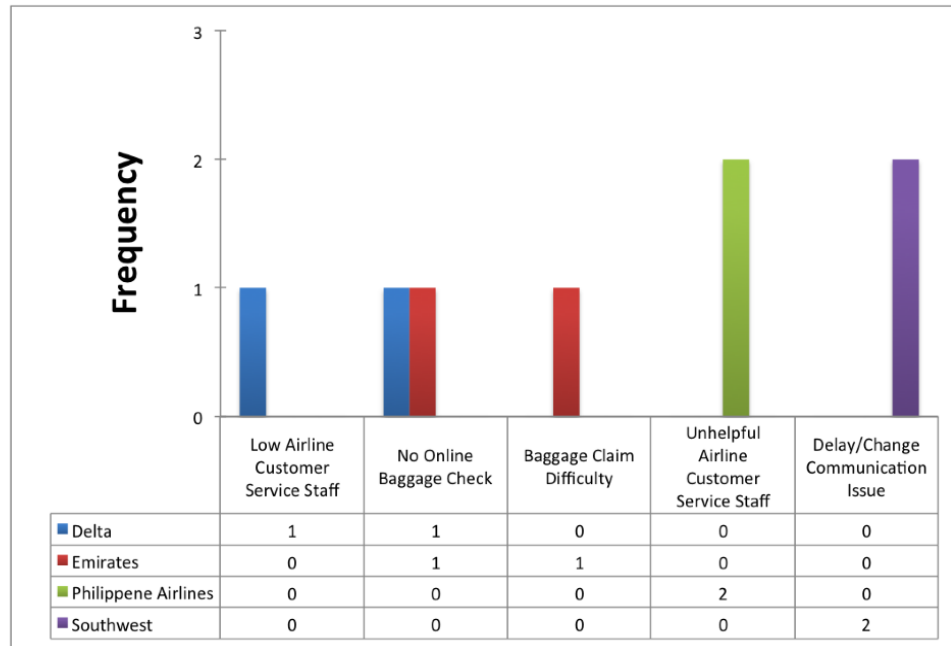
| ##   | AIRLINE | FLIGHT | DESTINATION | DESTMAR | DEPTIME  | HOWLONG       | Q8COM1 |
|------|---------|--------|-------------|---------|----------|---------------|--------|
| ## 1 | 8       | 242    | 18          | 4       | 07:20:00 | 79.999999999  | 20     |
| ## 2 | 38      | 1777   | 99          | 2       | 08:00:00 | 119.999999999 | NA     |
| ## 3 | 38      | 1777   | 99          | 2       | 08:00:00 | 104.999999999 | 999    |
| ## 4 | 8       | 242    | 18          | 4       | 07:20:00 | 19.999999999  | NA     |
| ## 5 | 38      | 1777   | 99          | 2       | 08:00:00 | 134.999999999 | NA     |
| ## 6 | 38      | 1777   | 99          | 2       | 08:00:00 | 119.999999999 | 103    |

Below are tabular representations of the barplot trio displayed in the previous page.

| ##   | Destination    | No. of Complaints |
|------|----------------|-------------------|
| ## 1 | Arcata, CA     | 4                 |
| ## 2 | Denver         | 1                 |
| ## 3 | Eugene, OR     | 3                 |
| ## 4 | Honolulu       | 2                 |
| ## 5 | Newark         | 2                 |
| ## 6 | Palm Springs   | 1                 |
| ## 7 | Salt Lake City | 3                 |

| ##   | Complaints                               | Frequency |
|------|--|-----------|
| ## 1 | Airline Delay                            | 2         |
| ## 2 | Baggage Claim Difficulty                 | 2         |
| ## 3 | Delay/Change Communication Issue         | 4         |
| ## 4 | Low Airline Customer Service Staff       | 3         |
| ## 5 | No Personnel for Connection Flight       | 1         |
| ## 6 | Short Connecting/Transfer Flight Time    | 2         |
| ## 7 | Unhelpful Airline Customer Service Staff | 2         |

### Complaint Comparison for Airlines with Similar Review Frequency



Although these airlines contained equal complaint counts, the complaints vary.

I hope this mini-project helps convey my skills and how I will make a great asset to you team.

Thank you,

Sandra