

DSC-640 Data Presentation & Visualization

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Assignment: Week 09-10

Story Title: Improving Passenger Experience Through Data-Driven Insights

Introduction:

In today's competitive travel landscape, delivering a seamless and enjoyable passenger experience is key to an airport's success. With the wealth of data available, analyzing passenger complaints provides valuable insights into areas that need improvement—from check-in processes to terminal facilities. This story delves into the trends and patterns in passenger feedback across major airports, identifying key pain points and frequent issues. By leveraging this data, airport authorities and stakeholders can make targeted, data-driven decisions to address these concerns, ultimately enhancing the travel experience. Let's explore how focusing on the right areas can elevate satisfaction and operational efficiency across the board.

Audience:

This story targets **executives and senior stakeholders in airport operations and customer service**, familiar with data insights but not necessarily this specific data. They can make decisions based on high-level trends and actionable insights. These stakeholders are concerned with improving customer experience, reducing complaint rates, and enhancing operational efficiency. This information can be propagated to the airlines authority to showcase how smooth the travelling is for that particular airport to attract more passengers to travel via that airport, as Customer satisfaction is one of the key factors during travel.

Datasets:

[Complaints by Airport](#)

[Complaints by Category](#)

[Complaints by Subcategory](#)

[IATA/ICAO](#)

Purpose and Call to Action:

Our goal is to identify areas for improvement by examining complaint trends and patterns. The insights will guide resource allocation, identify high-priority complaint categories, and highlight seasonal trends that affect operations. The call to action is for these leaders to prioritize targeted improvements in customer service and operational adjustments based on identified trends. This information will help to improve the customer experience for that particular airport and can be shared with the airlines authority to encourage them to attract more passengers to travel using that particular airport.

Medium:

A PowerPoint presentation is the chosen medium, with clear visualizations to communicate insights effectively in a boardroom setting. The PowerPoint will include concise text, visual aids, and embedded interactive elements.

Heatmap, bar plot, stacked bar, box plot and Trend Line created using Python for the visualization and included in the presentation.



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complaints_density_
map_top10.html



complaints_density_
map.html

Data Summary & Insights

We use the following four datasets to support our analysis:

- **complaints-by-airport.xlsx:** Contains theft counts of complaints by each airport during every month of the year.
- **complaints-by-category.xlsx:** The complaints-by-category.xlsx dataset provides a structured view of passenger complaints by category across various airports. Each record includes the complaint date, airport, category type, monthly occurrence, and a cleaned version of the complaint category for analysis. This data allows for tracking complaint trends by category and assessing common areas of concern in passenger experience.
- **complaints-by-subcategory.xlsx:** The complaints-by-subcategory.xlsx dataset provides detailed information on passenger complaints by both category and subcategory at different airports. Each entry includes the complaint date, airport

name, category and subcategory of the complaint, monthly counts, and cleaned versions of the category and subcategory fields for clarity. Additionally, it includes a flag indicating if category prefixes were removed for data standardization, making it easier to analyze specific complaint types within broader categories and identify pain points in passenger experience.

- **iata-icao.xlsx:** The iata-icao.xlsx dataset contains geographic and identifying information for airports worldwide. Each record includes the airport's IATA and ICAO codes, country code, region name, and precise location coordinates (latitude and longitude). This data supports spatial analysis and mapping of airports, enabling a better understanding of airport distribution and the regional context for complaint data. It's particularly useful for visualizing trends geographically and correlating passenger feedback with specific airport locations.

Together, these datasets will allow us to create different visualizations on TSA complaint raised in different airports.

Design:

When designing the heat maps, custom visuals, box plots, and spatial/choropleth maps, I incorporated Gestalt's principles to enhance clarity, organization, and visual appeal, aiming for an intuitive user experience that supports data insights and storytelling.

Design Elements:

Color: Used a gradient color scheme (e.g., yellow to red) to represent intensity, where deeper colors denote higher complaint counts, enhancing immediate understanding. Leveraged distinct colors for different categories and subcategories to visually separate data points. Used a gradient or region-based coloring to indicate density or count by geographic area, supporting spatial patterns.

Text: *Used clear, concise labels and titles for each visual to ensure viewers understand data dimensions, units, and timeframes. Emphasized primary categories and key statistics using slightly larger or bolder fonts, while smaller fonts were used for detailed data points, maintaining visual hierarchy.*

Sizing: *Sized each visual based on the data complexity, with larger visuals for more detailed data like spatial maps, allowing viewers to see intricate data without crowding. Designed visuals to be scalable on different screen sizes without losing clarity, ensuring accessibility across devices.*

Spacing: Incorporated adequate whitespace between visuals, preventing clutter and making it easier for viewers to focus on each chart independently. Used consistent margins to separate different data points within the same chart, ensuring that individual elements are easily distinguishable.

Ethical Considerations:

In leveraging passenger complaint data to improve airport experiences, it's essential to uphold ethical standards by ensuring that personal information remains anonymous and secure. Transparency about how data is collected and used fosters trust and respects passengers' privacy. Additionally, decisions driven by this data should avoid any biases, aiming to create fair and equitable improvements that benefit all travelers.

1. **Data Privacy:** Ensure that all passenger data is anonymized to protect individuals' privacy, especially sensitive information that could reveal personal details.
2. **Transparency:** Clearly communicate to passengers how their data is collected, stored, and used to build trust and maintain transparency.
3. **Data Security:** Implement robust security measures to prevent unauthorized access or misuse of passenger complaint data.
4. **Purpose Limitation:** Use data solely for the intended purpose of improving passenger experience, avoiding secondary uses that passengers may not consent to or expect.