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Introduction

Data Visualization is an essential part of data analysis, turning complex data sets into more easily understood and interpreted visual representations. One way to define data visualization is that it is the graphic representation of data. It tells a data story in a straightforward, visually appealing, and powerful way. The "main goal of data visualization is to communicate information clearly and effectively through graphical means," according to Vitaly Friedman. (Saxena, 2024) Data visualization makes use of graphical components like charts, graphs, and maps to help users spot patterns, trends, and outliers that might not be immediately obvious from raw data. Better decision-making is facilitated by this method, which gives stakeholders clear and understandable insights into the data. (Pykes, 2022)

Data Visualization is of even higher importance in the context of multidimensional data sets, where the interactions between variables can be complex and difficult to understand. These complexities can be made simpler by effective visualizations, allowing people to examine and understand vast amounts of data quickly and easily.

Dataset

This report aims to analyze a multidimensional data collection containing flight performance parameters using several visual analytics techniques. The analysis's data set includes comprehensive flight performance measures from a range of Australian airlines and destinations. The data set spans multiple years, with each year represented in a separate sheet within an Excel file. These sheets were combined into a single, unified data collection, which allowed for thorough analysis across several routes and time periods.

Key fields in the data set include:

- Route: The specific flight route (such as Sydney-Melbourne or Sydney-Brisbane)
- Departing Port: The airport from which the flight departs.
- Arriving Port: The airport at which the flight arrives.
- Airline: The airline operating the flight.
- Year: The year of the flight operation.
- Sectors Scheduled: The number of flights scheduled for the route.
- Sectors Flown: The number of flights that were flown.
- Cancellations: The number of flights that were canceled.
- Departures On Time: The number of flights that departed on time.
- Arrivals On Time: The number of flights that arrived on time.
- Departures Delayed: The number of flights that departed late.
- Arrivals Delayed: The number of flights that arrived late.
- On-Time Departures (%): The percentage of flights that departed on time.
- On-Time Arrivals (%): The percentage of flights that arrived on time.
- Cancellations (%): The percentage of flights that were canceled.

Geospatial Data Visualization

As the dataset mainly refers to the locational data, different geospatial data visualization techniques are used in this report. With the help of data points and geographic information, geospatial data visualization is an effective tool that creates spatial context. Typically, static, or interactive maps are used to visualize geospatial data. Maps enable the creation of context for the data by highlighting particular locations and revealing trends through the use of colors or shapes. (Kruszynska, 2022) It works especially well when examining data that is geographically associated by nature, like flight performance measurements, which is what our dataset contains.

In this project, geospatial visualization techniques were used to:

- Display Airports: This feature allows us to view various Australian airports sized according to the number of planned flights and colored according to performance measures like cancellations and on-time departures.
- Analyze Routes: Show the paths taken by aircraft between airports, including information on how effective the routes are and pointing out those that have a high cancellation rate.
- Analyze Regional Achievement Comparatively: To enable a regional comparison of airline performance, using pie charts on maps to show the performance of various airlines at different airports.

For this report geospatial visualizations provided an intuitive way to explore the spatial dimensions of flight performance data, highlighting geographical factors that may influence operational efficiency and punctuality.

Visualization Tool: Tableau

Tableau is the visualization tool that was used for every visualization in this report. Tableau is ranked as a leader in analytics and business intelligence by Gartner's Magic Quadrant. Founded in 2003, this American company has experienced rapid growth due to its exceptional data visualization and business intelligence capabilities, which are utilized for reporting and analyzing large amounts of data. (Biswal, 2024)
Various Tableau features were tried and used during the analysis for this report. Tableau is one of the most widely used business intelligence (BI) programs because of its many intriguing and distinctive features. It has many features available, such as:

- User-Friendly Interface: Without requiring a lot of programming experience, users may construct sophisticated visualizations using Tableau's drag-and-drop feature.
- Integration Capabilities: Tableau is flexible and adaptable because it integrates easily with a wide range of data sources, including Excel, SQL databases, and cloud services.
- Interactive Dashboards: Users can create interactive dashboards that offer real-time data analysis and exploration.
- Advanced Analytics: Tableau is compatible with several advanced analytical methods, such as trend analysis, forecasting, and clustering.
- Customization: Users have a great deal of control over how visualizations are modified to meet their own analytical needs and preferences.
  (GeeksForGeeks, 2023)

Tableau's powerful visualization features were used in this project to evaluate and comprehend the flight performance data collection. The tool's adaptability and interactivity were vital for creating data visualizations that offered insightful analyses.

Visualization Methods

This section of the report will provide detailed explanations of the visualizations used, their technical implementation as well as the advantages and disadvantages.

1. Geospatial Data Visualization (Map Visual)

Geospatial visualization is used to provide spatial context to data, helping to identify regional patterns and trends. Dataset with a significant spatial component, like airport performance statistics, benefit greatly from this type of visualization as it assists us to see the data value represented in the actual map. This method is ideal when the location of data points is crucial for analysis. It facilitates understanding of the ways in which spatial variables affect performance measures which is why it was implemented in this report to understand the performance metrics regarding airports and airlines.

Advantages:

- It offers a distinct spatial context that facilitates the identification of regional patterns and trends.
- It helps to improve understanding of the ways in which geography influences performance.
- It allows interaction with the map which allows users to go further into particular data points.

Disadvantages:

- When there are too many data points the visualization might get cluttered and difficult to interpret.
- It requires accurate geospatial data for effective visualization and might not work otherwise.

2. Bar Chart

Bar charts are among the most widely used and recognizable charts. In bar charts, one numerical and one categorical variable are plotted, and values are represented by the length of the horizontal or vertical bars. (Sukumar, 2024) Bar charts work well for comparing discrete categories, which makes them appropriate for evaluating performance indicators.
This visualization technique has been used few times in the report because, in comparison to other visualizations, it is easy to grasp and effectively provides the comparison metrics such as across multiple routes or airlines.

Advantages:

- They are quite straightforward, simple to understand, and easy to interpret.
- Bar charts work incredibly well when comparing distinct groups.

Disadvantages:

- They are good only to compare a limited number of categories at once, and they get messy when there are lots of categories.
- They are not capable of complex analysis such as for showing relationships or trends over time.

3. Stacked Bar Chart

Stacked bar charts are a modified version of original bar charts. One categorical variable is shown as bars in a standard bar chart; however, two categorical variables are shown in a stacked bar chart. The first variable is displayed along the whole bar whereas the second variable is represented by stacks inside each categorized bar. (Velez, 2022)
It allows for the comparison of both the overall and individual contributions and is utilised when it's important to display the composition of the whole. This visualization technique was suited for the dataset used in this report as it helped compare the contribution of different sub-categories within a total category.

Advantages:

- Provides a thorough analysis of each contribution made within a particular category.
- Facilitates the viewing of both the overall and individual contributions.

Disadvantages:

- Too many segments may make the content challenging to read.
- For some scenarios comparing individual segments across different bars is more difficult.

4. Line Chart

A line graph consists of a set of data points connected by straight line segments on two axes and is commonly employed to show change over time. Since one set of data is constantly dependent on the other, the line graph helps in illustrating the link between the two sets of numbers. They are usually used to observe changes across both short and extended timeframes. (Salm, 2024)
Line charts are used to show trends over time. They help in the analysis of trends in the overall number of flights operated or other performance indicators across various years in this dataset.

Advantages:

- It's a great method for displaying trends over time.
- It can manage several series for comparison in an efficient manner.

Disadvantages:

- This approach may become crowded with too many lines when used with several arguments.

- It requires cautious scale selection in order to prevent misunderstandings.

5. Area Chart

An area chart, also known as a mountain chart, is a kind of data visualization that combines a bar chart's and line chart's visual elements. It's often used to illustrate how changes in numerical values are dependent upon a second variable, typically a time frame. Area graphs are eye-catching charts that, due to their variety of colors and distinctive designs, may grab the attention of the audience immediately. (Calzon, 2023)
Area charts are typically helpful for displaying the entire contribution of different components over time and spotting cumulative trends. They are used to display the percentage of cancelled flights by airline in this dataset.

Advantages:

- It is a useful option for displaying proportions and cumulative data.
- It is a useful method for displaying patterns and trends in big data sets.

Disadvantages:

- When too many data series are layered together, it may become challenging to interpret in particular circumstances.
- It requires careful use of color and transparency.

6. Pie Chart on Map

A Pie Chart Map is simply a combination of a Pie Chart data visualization and a map. It is used to simply visualize numerical proportion and location. Pie charts and geographic data are combined in this visualization technique to compare specific parameters, such as the performance of different airlines at different airports in this report.

Advantages:

- It is a very easy and eye-catching way to illustrate dimensions.
- Because it successfully mixes spatial and categorical data, it is excellent for datasets with spatial context.

Disadvantages:

- It is not a useful option for comparison because it makes comparing different categories difficult.
- If there are too many slices, it could be challenging to interpret.

7. Dual Axis Chart

When showing the relationship between two variables, a dual-axis chart is utilised. More precisely, the relationship between two or more measures of varying amplitude and scale can be illustrated using these charts. (Saxena, 2024) It has been effectively used in this report to compares two related metrics on the same chart, such as on-time departures and cancellations.

Advantages:

- Because it enables the direct comparison of two related measurements, it works well for comparative visualization.
- It can be used for trend Analysis as it effectively shows trends and relationships over time.

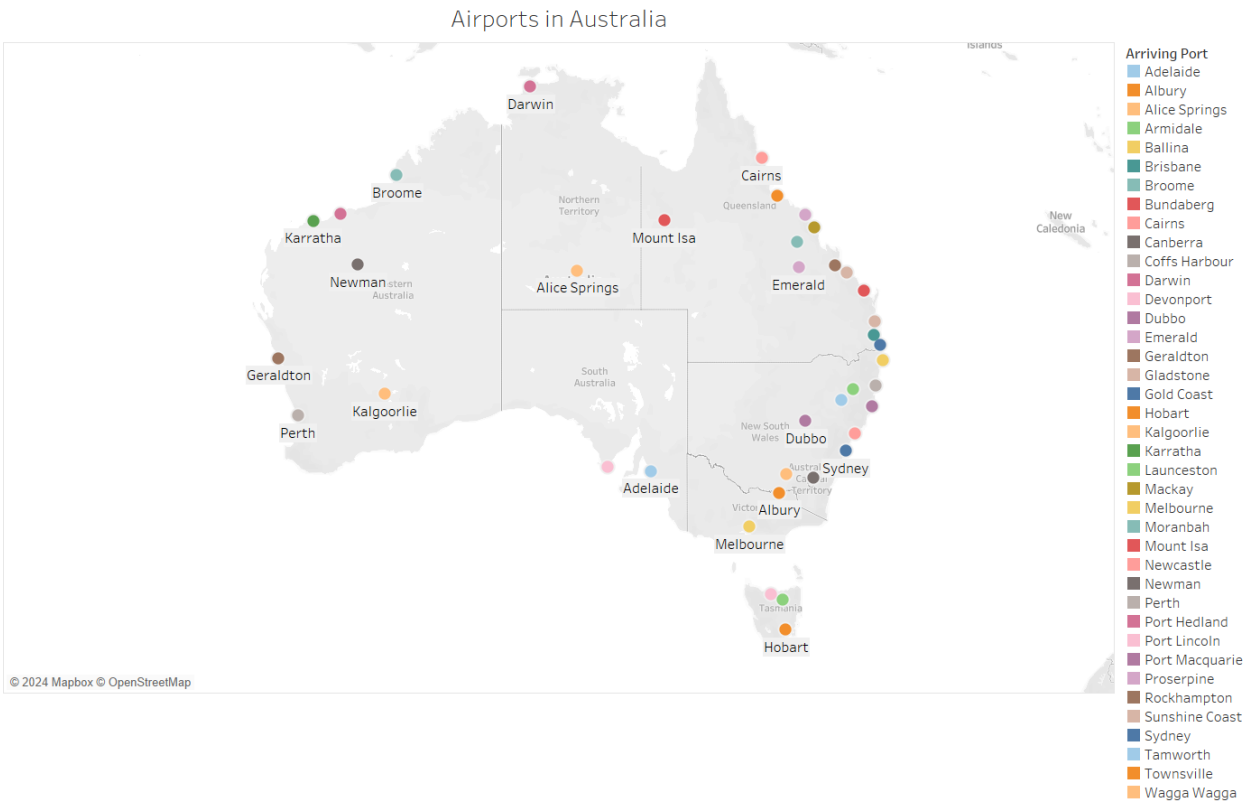
Disadvantages:

- When there is too much data, this kind of visualization can become cluttered and difficult to understand.
- For accurate reading, the scales must be carefully aligned.

Visualizations and Analysis

Geospatial Visualization of Airports in Australia

The map visualization below displays all 39 different airports in Australia included in the dataset. The map, with each airport marked with a unique color, offers a thorough understanding of the locations of airports and the connections between them around the nation. Due to their pivotal roles in both domestic and international flights, major cities like Sydney, Melbourne, and Adelaide are prominently shown in the visualization as essential hubs of airline activity. Smaller rural airports are also visible, demonstrating Australia's extensive network of aviation infrastructure.



From above visualization we can see that there is a noticeable concentration of airports along the eastern coast, especially along Queensland's, New South Wales', and Victoria's right boundary. The greater density of airports in this region can be explained by the fact that it contains important population and commercial centers. The eastern seaboard can be seen as a a vital air transport route, according to the geographical distribution.

Geospatial Visualization of Airports in Australia by Scheduled Flights

The following map visualization shows the many airports in Australia where the size of each circle corresponds to the number of scheduled flights at each airport. Airports with more scheduled flights are indicated by larger markers, and those with less scheduled flights are indicated by smaller markers. This graphic illustration makes it possible to swiftly assess the amount of air traffic that each airport manages and identify which airports are busier in terms of scheduled flight operations.

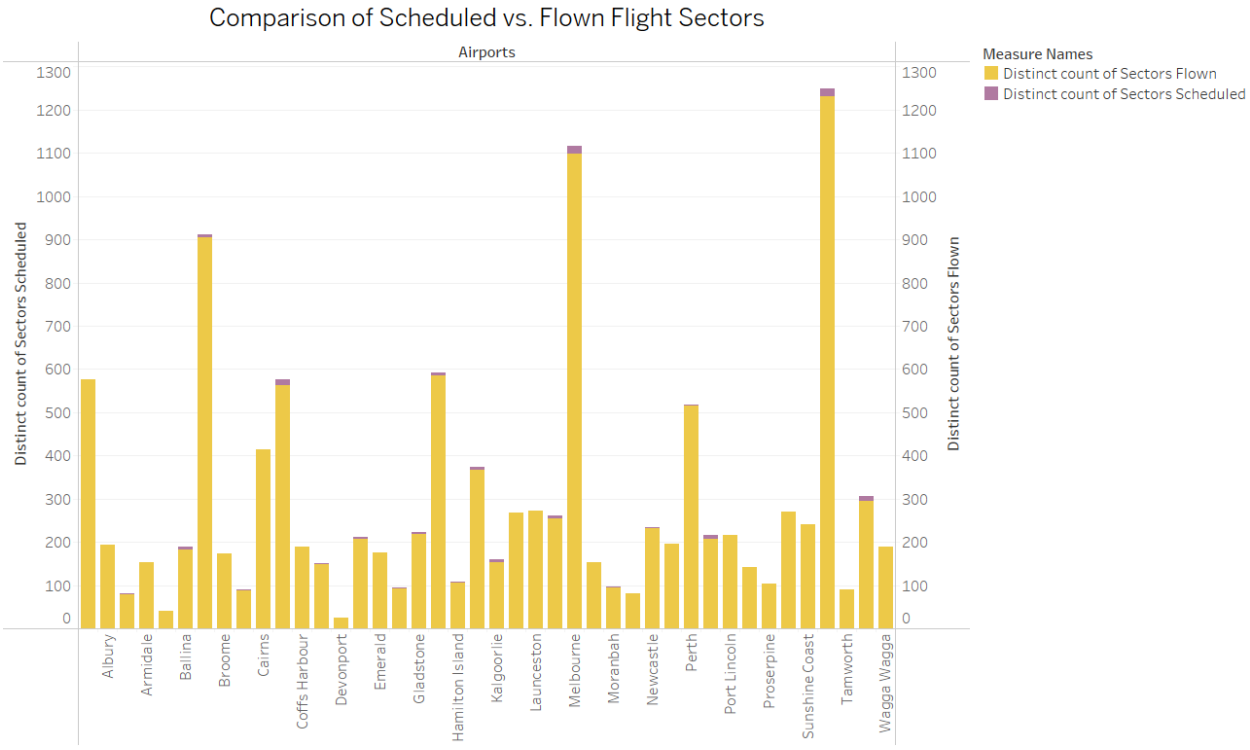
Sydney is represented with the largest circle on the map, which means it has the most scheduled flights. This reflects Sydney's status as Australia's busiest airport, serving as a major hub for both domestic and international flights. Following Sydney, Brisbane, Melbourne, and Perth are notable for their large circles, indicating strong scheduled flights volumes. These cities have a lot of air traffic since they are among the most important hubs for the economy and population.

Canberra, Adelaide, Darwin, Cairns, and Hobart are among more notable circles in the above visualization. These cities handle a sizable number of flights despite not being as big as the airports described above, demonstrating their significance for regional connectivity. The major air traffic hubs in Australia are highlighted by the size and distribution of the circles, which are primarily concentrated in major metropolitan centers and along the eastern seaboard.

This visualization can allow us to visualize determine which airports are most important to the country's air transportation network and help prioritize resource allocation, as well as plan for future infrastructure needs to keep these vital hubs operating efficiently to guarantee the seamless operation of the whole aviation industry.

Comparison of Sectors Scheduled and Sectors Flown by Airport

This stacked bar chart presented below compares the number of sectors scheduled and sectors flown across various airports in Australia. The feature "Sectors Flown" in the dataset represents the actual number of flight sectors that were completed or flown by the airline during a specific period. This is a crucial operational indicator that shows how well the airline is actually performing in comparison to its scheduled operations. It helps us evaluate the operational effectiveness and dependability of the airline by contrasting "Sectors Flown" with "Sectors Scheduled." A lower number of flown sectors than expected could be a sign of operational problems or cancellations.



It is noticeable from the graph that Sydney and Melbourne have a small top portion of purple on the bar which appears the most in the graph, representing sectors scheduled but not flown. This suggests some degree of cancellations or operational adjustments for these airports. However, we need also consider that these two airports have the tallest bars, which means that they manage the highest volume of flight sectors in Australia so which could be the reason of higher cancellations. While not having towering bars, airports such as Canberra, Townsville, and Port Hedland do display a minor but visible purple part, suggesting that some scheduled sectors did not convert into flown sectors, though in smaller numbers. This could be something to looked into that why do these airports, even with smaller volume of flights are suffering cancellations.

Most other airports have bars with little to no purple section and a whole yellow height signifying the sectors flown. This implies that there are few cancellations or modifications and a high conversion rate from scheduled to flown sectors at these airports.

The effectiveness and dependability of airport operations are effectively highlighted by this visualization. Through this we can identify airports with higher discrepancies, investigate underlying causes, and implement strategies to enhance operational efficiency. This visual also aids in understanding the scale of operations at different airports, helping in resource planning and management.

Airline Performance by Airport: Pie Chart Visualization on Map

The map visualization that is displayed below shows the performance of various airlines at various airports. Every airport is represented by a pie chart that displays the percentage of flights flown by various carriers. The pie chart shows a comparison of airline presence and performance across airports, the size of the pie correlates to the total number of flights from that airport.

Key Components of the Visualization:

- Airports: Each pie on the map represents an airport.
- Airline Proportion: The pie charts show the proportion of flights operated by different airlines at each airport, with each segment representing an airline.
- Flight Volume: The size of the pie charts corresponds to the number of flights, allowing for an assessment of airline activity at each airport.

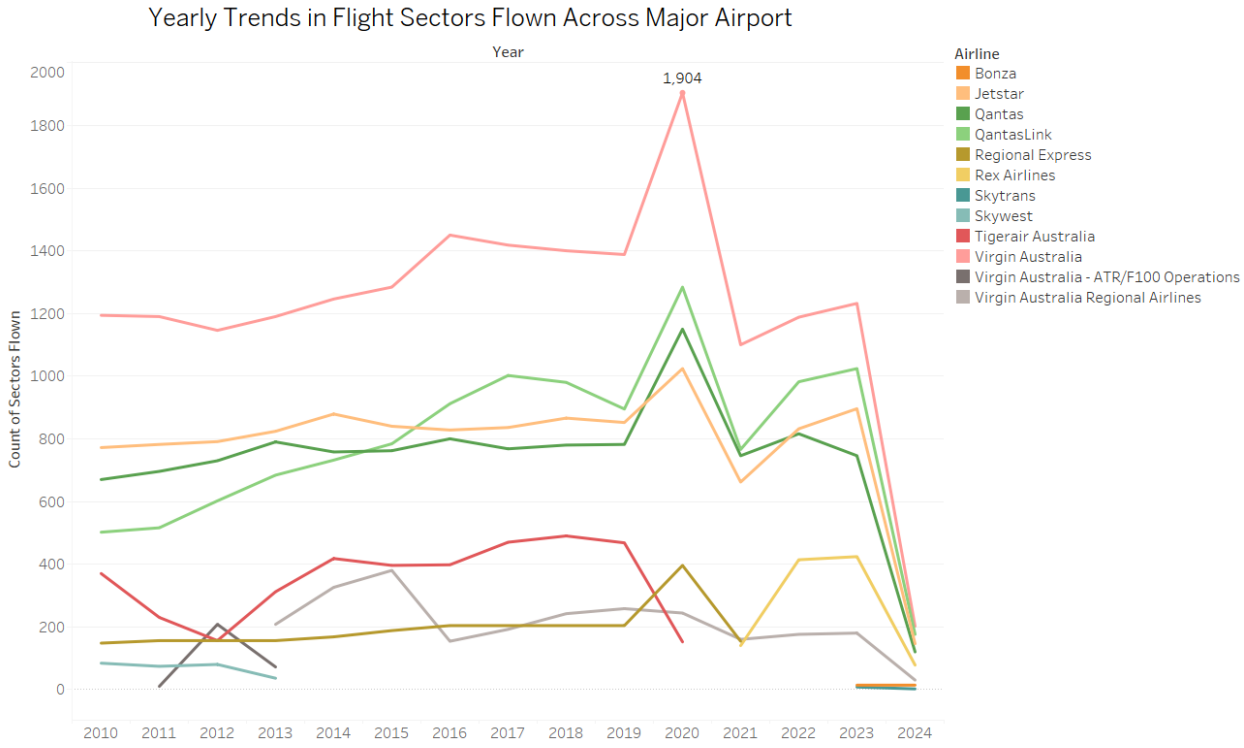
Nine major airlines are shown on the map, each represented by a different color. QantasLink, represented in maroon, is highly noticeable, particularly along the eastern coast. This shows how extensively QantasLink operates in this highly populated area. Qantas (gold), Virgin Australia (grey), and Jetstar (light blue) are a few other notable participants. These airlines are well-represented over a wide range of airports, as seen by their noticeable pies in several pies. Smaller

airlines are represented in smaller quantities throughout the pie charts. Examples of them are Bonza, Regional Express, Rex Airlines, Skywest, and Tigerair Australia. Compared to the major carriers, these airlines are less well-known and more dispersed.

The competitive environment of Australia's airline sector is reflected in the pie chart distribution pattern, where larger carriers dominate main hubs and smaller airlines serve local or rural markets. This visualization is particularly useful for identifying the principal carriers at each airport, the distribution of market shares, and the ability to plan for capacity and infrastructure requirements based on the dominance of airlines in particular regions. This information can be crucial for decision-making in airline operations, airport management, and policy planning.

Yearly trends in Airline Operations

This line graph below depicts the count of sectors flown by various airlines over the period from 2010 to 2023. This is a trend analysis of flight activity over several years at various airlines. The number of sectors flown by various airlines over time is represented by each line or segment in the graph, with each airport being identified by color. The years are shown on the x-axis, while the number of sectors flown is shown on the y-axis.



Virgin Australia has maintained its leading position in the Australian airline industry over this time, as evidenced by its steady performance at the top. The beginning of 2020 was the peak of Virgin Australia's operations, just before a notable decline that impacted all airlines in 2020 and 2021 - likely because of the COVID-19 pandemic. QantasLink shows a significant rise in

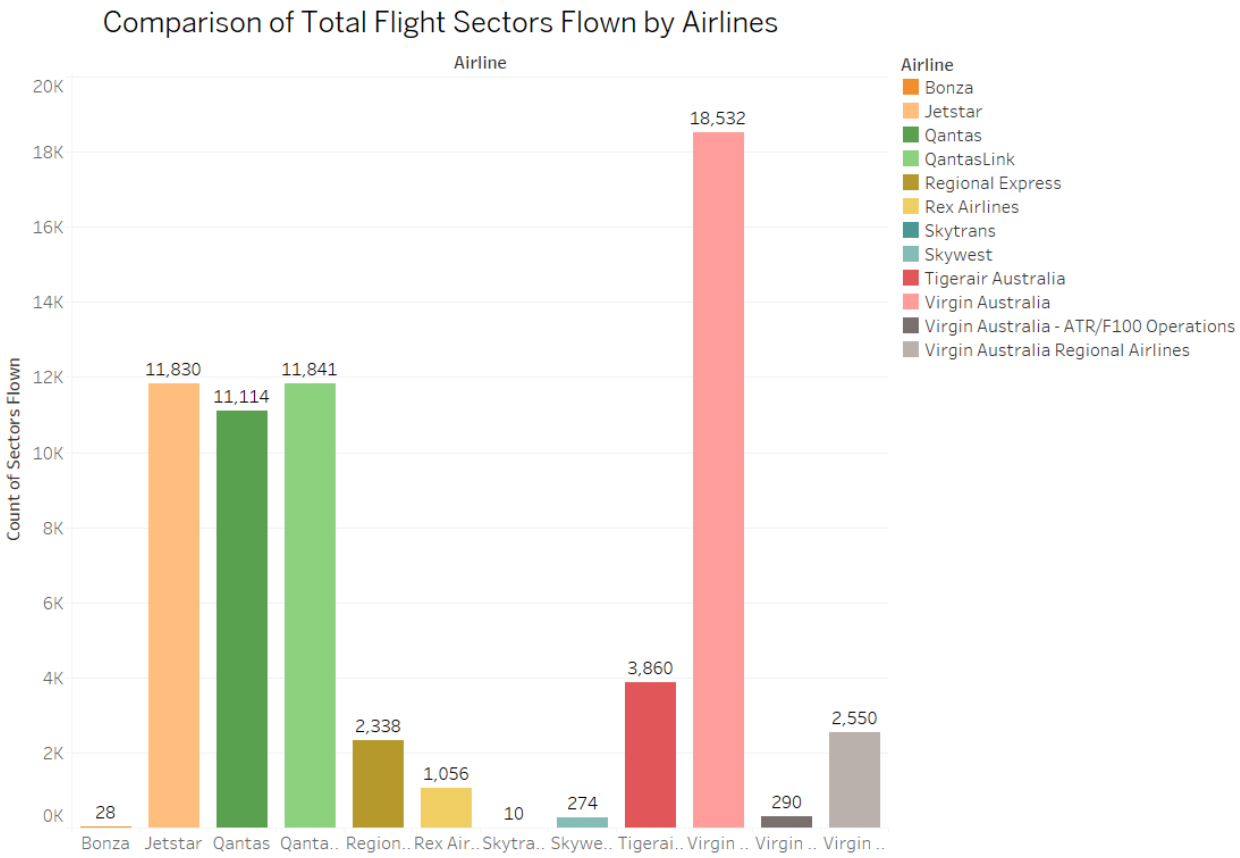
operations, moving from fourth place in 2010 to second place in 2016, maintaining this position close behind Virgin Australia until 2023. This rise suggests that QantasLink's operational capabilities and market presence have expanded. QantasLink surpassed Jetstar and Qantas, which had been ranked second and third respectively in terms of the number of sectors flown. As of 2023, Jetstar and Qantas were firmly established in third and fourth place, respectively.

The graph shows a steep drop for all airlines in 2020 and 2021, which is in line with the effect of the Covid-19 pandemic on international air traffic. A significant drop in operations occurred during this time, which was indicative of several flight cancellations and a decline in demand. The graph shows a gradual rise in the number of sectors flown by all airlines starting in 2022, indicating a recovery in the airline industry as travel restrictions began to lift and demand began to pick up again.
Skywest's operations came to an end in 2013, following its acquisition by Virgin Australia Holdings, which renamed it as Virgin Australia Regional Airlines. (Nadalet, 2024) The graph clearly illustrates this shift, with Virgin Australia Regional Airlines commencing flights in 2013. Virgin Australia's ATR/F100 operations were recorded from 2011 to 2013, at which point they ceased, most likely because of changes in the airline's internal operations or fleet reorganization. The two newest players in the industry, Bonza and Skytrans, began operations in 2023. Their inclusion in the graph illustrates how the airline sector is changing as new rivals enter the market.

A thorough understanding of the patterns and changes in the Australian airline sector over a thirteen-year period can be obtained from this line graph. It successfully depicts the dynamic changes in market positions among various airlines and draws attention to the effects of significant events, such the COVID-19 epidemic, on airline operations.

Total Flights Flown by Airlines

The total number of flights operated by different airlines is shown in the bar chart below. The airlines are shown on the x-axis, while the number of sectors flown is displayed on the y-axis. Airlines are distinguished from one another using color schemes. This graph makes it simple to compare the overall number of flights operated by various airlines. Taller bars correspond to airlines that flew more sectors.

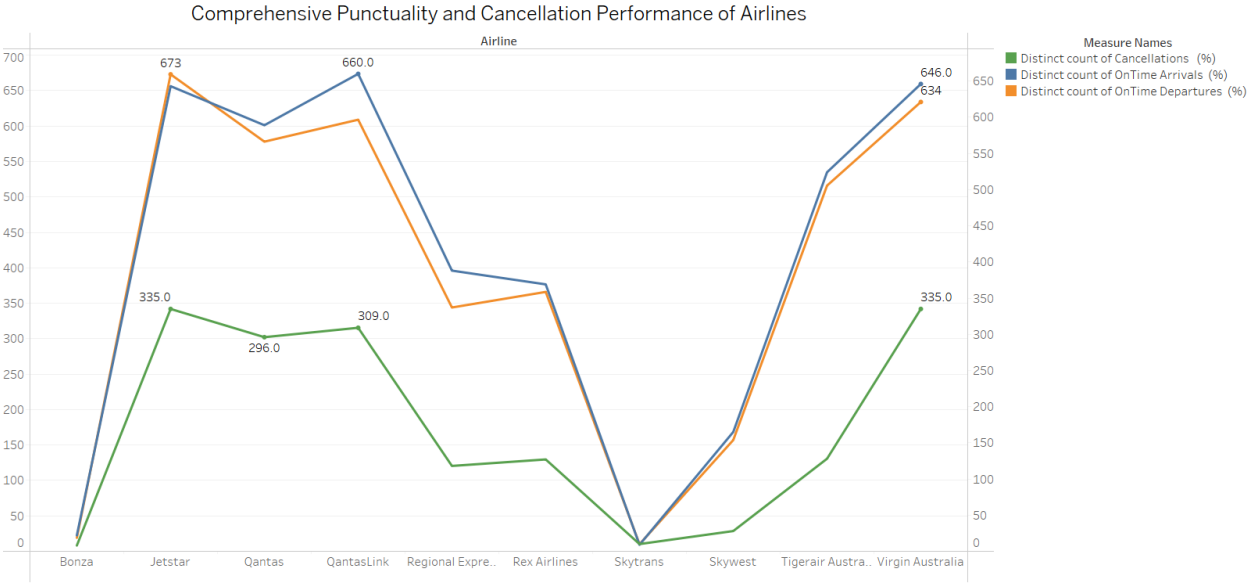


Virgin Australia is clearly the leading airline, having flown 18,532 sectors in total. This demonstrates Virgin Australia's broad operating network and notable market dominance. The closest competitors are Jetstar with 11,830 sectors flown, QantasLink with 11,841 sectors flown, and Qantas with 11,114 sectors flown. Although they lag behind Virgin Australia, these airlines are important rivals in the market and add to the variety of airline options accessible to customers.

With only 10 sectors flown, Skytrans has the fewest number of flown sectors, followed by Bonza (28 sectors) and Virgin Australia - ATR/F100 Operations. This is also due to the reason covered in the previous section, which is that Virgin Australia's ATR/F100 operations were discontinued in 2013, and the new airlines Skytrans and Bonza were only launched in 2023. Other airlines fall in between these extremes, contributing moderate numbers to the total count of sectors flown. This distribution illustrates how the various airlines in the dataset vary in terms of their operational scale.

Exploring Airline Punctuality and Cancellation Performance

This visualization below provides an in-depth analysis of airline punctuality metrics, including on-time departure, on-time arrival, and cancellation percentages, using a line graph visualization. The analysis however only focuses on major airlines with higher volume operations to understand their performance in these key areas.



The line graph displays three key punctuality metrics, on-time departure, on-time arrival, and cancellation percentages, across the airlines. In earlier sections, Jetstar, Virgin Australia, and QantasLink stood out as major operators with substantial volume operations, thus it is important to take a closer look at how they performed in each measure.

Jetstar and Virgin Australia have the highest cancellation percentage peaks, both coming in at 335. With a peak of 309, QantasLink comes in close second, with Qantas lagging slightly behind at 296. These peaks show times when flight cancellation rates for the corresponding airlines were greater than average.

QantasLink exhibits the greatest peak for on-time arrival percentages, at 660, demonstrating its outstanding performance in guaranteeing punctual arrivals. Following closely after with peak values of 646 and 643, respectively, are Virgin Australia and Jetstar. These measures show how well the airlines can keep their flight schedules on time.

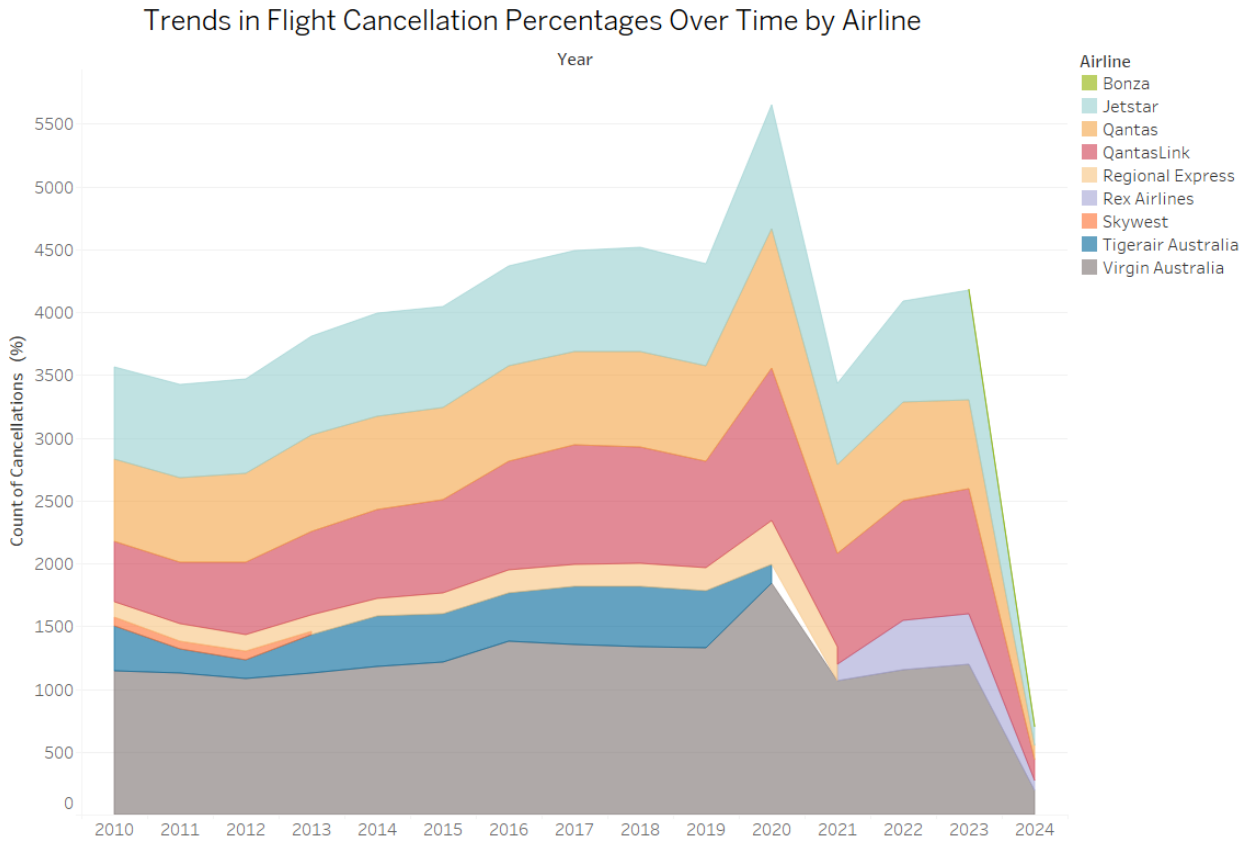
Jetstar has the greatest peak on-time departure % (673), which shows that it performs well in keeping to departure times. Similar peaks of 634 and 609 are recorded by Virgin Australia and QantasLink, respectively. These peaks show the times when the airlines were able to guarantee flight departures on schedule, which improved overall operational effectiveness.

Airlines such as QantasLink prioritize on-time arrivals and have set a high bar for dependability and are viewed as the go-to option by travelers who value punctuality. On the other hand, Jetstar's

ability to depart on schedule highlights its operational excellence and draws passengers looking for hassle-free travel. However, Virgin Australia's high cancellation rates point to areas that need to be improved to strengthen operational reliability and build consumer trust, even in spite of the company's generally excellent punctuality performance.

Analyzing Airline Cancellation Trends

This graph below takes a closer look in the trends in flight cancellation by airlines. The visualization provides a thorough picture of the operational issues and resiliency of major airlines by highlighting the cancellation percentages for various years through the use of an area map visualization. Using an area chart with airlines as color allows for a clear comparison of cancellation percentages over time for each airline. The color-coded areas enable a direct comparison of cancellation trends between different airlines.



The graphic shows an important shift of cancellation peaks for all airlines in 2020, which corresponds to the start of the COVID-19 epidemic worldwide. This alignment highlights the extraordinary difficulties the aviation sector encountered at the time, such as restricted travel, lower demand, and operating limitations. As a result of airlines adapting their strategy to minimize inconveniences and restore operational stability in the face of changing conditions, a collective

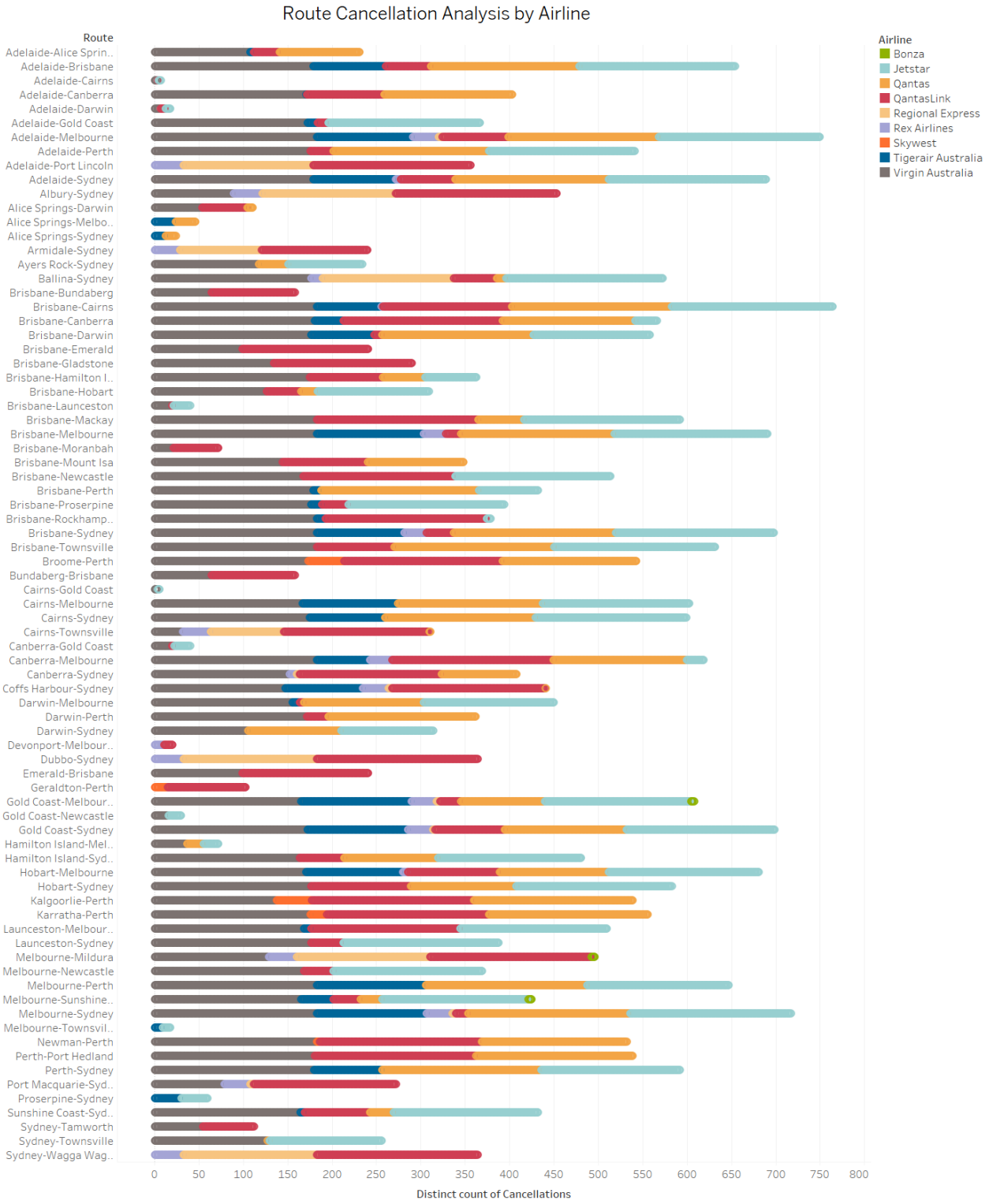
recovery phase is indicated by the subsequent decline in cancellation percentages seen across all airlines in 2021.

Virgin Australia has the highest cancellation percentage as seen by its vast grey area coverage on the graph. The wide range denotes greater percentages of cancellations, indicating difficulties or interruptions in the airline's operations over time. Jetstar (blue), Qantas (orange) and QantasLink (pink) are the other airlines with large areas on the map. But along with it the thing to consider for these airlines is their respective market shares and quantities of operations. Having higher volume of operations could lead to more cancellations. These airlines' competitive positioning highlights their ability to adapt and be resilient in the face of industry disruptions while preserving operational efficiency.

By monitoring cancellation trends over time, airlines can identify areas for operational improvement, optimize resource allocation, and enhance crisis management strategies to mitigate the impact of unforeseen disruptions.

Cancellation by Route

The visualization of the bar chart that is shown below gives a clear picture of the cancellation trends for various airline routes. We can discover specific trends and identify routes with greater cancellation frequency by plotting the routes on the columns and the number of cancellations on the rows, with airlines identified by color.



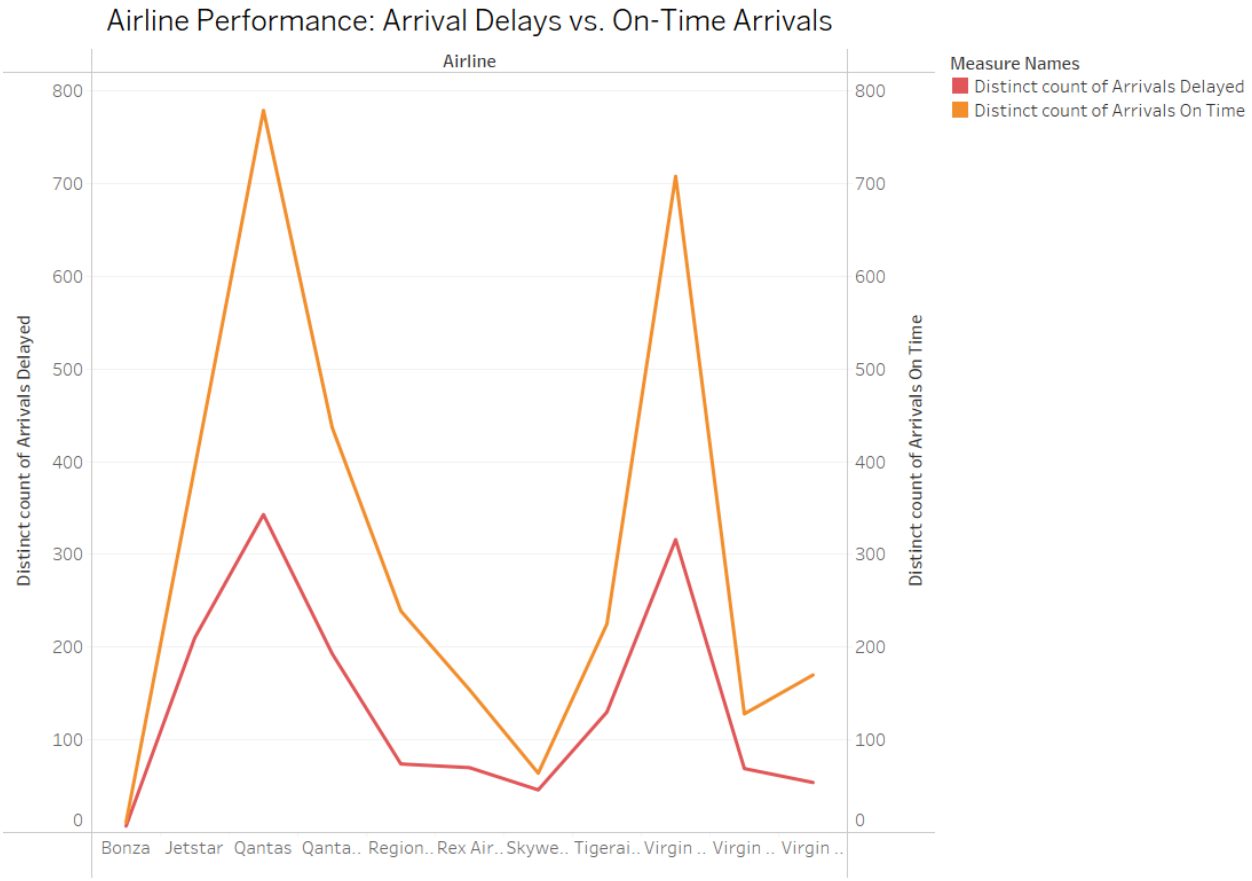
The most frequently cancelled routes are those between the cities Brisbane and Cairns. This may indicate operational challenges or demand fluctuations specific to this route. The Melbourne-Adelaide route and the Melbourne-Sydney route follow closely in terms of cancellation counts. These high-traffic routes are critical to the network and can be susceptible to disruptions due to various factors such as weather conditions, airport congestion, and logistical issues.

Airlines and airport authorities can address specific operational difficulties by identifying routes that have higher cancellation rates. Increased cancellations on the Brisbane-Cairns route, for example, could prompt an inquiry into the causes of these interruptions and result in focused improvements. Furthermore, this analysis can help airlines reduce the effect of cancellations on high-risk routes by guiding schedule modifications, resource allocation, and contingency preparation.

Having a better understanding of the cancellation patterns on various routes facilitates more effective strategic planning and decision-making. Additionally, by using these insights to guide customer service tactics, travelers on frequently impacted routes will receive greater support and information, which will improve their overall travel experience.

Airline Arrival Performance

The following line chart visualization provides an extensive overview of the different airlines' timeliness performance. The number of on-time arrivals is shown by the orange line, and the number of delayed arrivals is represented by the red line. By displaying both arrival delays and on-time arrivals, this chart allows for a direct comparison of each airline's performance in these two key areas.



The number of on-time arrivals (orange line) is consistently higher than the number of delayed arrivals (red line) for all carriers. This implies that even while there are still noticeable delays, airlines generally do a good job of staying on schedule.

When it comes to both delayed and on-time arrivals, Qantas is the leader. The high percentage of punctual arrivals is indicative of Qantas's dependable and efficient operations. The concurrently large number of delayed arrivals, however, suggests that even with a solid performance, there are still a lot of noteworthy cases of delays that require attention. In both metrics, Virgin Australia trails Qantas which suggests a similar trend in which the airline manages to guarantee on-time performance but experiences a significant number of delays.

High percentages of delayed arrivals for high-performing airlines, such as Virgin Australia and Qantas, indicate that although these carriers maintain a high percentage of on-time flights, external causes and operational difficulties continue to affect their performance. Airlines can study times or routes that are more likely to experience delays and put corrective measures in place by looking at the trends and spikes in delayed arrivals.

This type of information can help airlines better communicate about delays and manage passenger expectations proactively as part of their customer service efforts. This data can also help with long-term strategic planning, as airlines can use it to identify routes and schedules that need greater attention and resources to be more punctual.

Conclusion

This report uses a range of Tableau visualization tools to present an in-depth analysis of airline performance in Australia. The visualizations, which include maps, bar charts, stacked bar charts, line charts, area charts, pie charts on maps, and dual-axis charts, offer deep insights into various aspects of airline operations.

The map visualizations highlighted the concentration of air traffic in major hubs like Sydney, Brisbane, and Melbourne while minor but noteworthy activity was noticed in airports like Adelaide, Darwin, and Cairns. The difference between scheduled and flown sectors is displayed in stacked bar charts, which highlight operational inefficiencies at smaller airports like as Canberra and Port Hedland.

Line and area charts showing trends in airline performance from 2010 to 2023 highlight the dominance of Virgin Australia and Jetstar as well as the Covid-19 pandemic's effects on flight operations. Analysis of cancellations and on-time performance highlights the difficulties big airlines have in staying on schedule. Route efficiency analysis points to important routes that require operational improvement, such as Melbourne-Sydney and Brisbane-Cairns, where high cancellation rates are present.

The combination of these visualizations offers insightful information about how airlines and airports operate, highlighting trends and patterns that are essential for making informed strategic decisions. The report emphasizes how well Tableau visualizes complex, multidimensional data, providing operators of airlines, airport authorities, and legislators with useful information to improve operational effectiveness and customer satisfaction. Further analysis incorporating advanced data processing and automated techniques can complement these visual insights, enabling a more holistic approach to managing and optimizing airline operations.

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