

Airline Operations and Revenue Analysis

Objective

To analyze flight operations, passenger demographics, and revenue distribution to uncover patterns that can help improve airline performance and customer targeting.

Key Questions Addressed

- Which airlines and routes experience the most delays or cancellations?
- What is the demographic profile of our passengers?
- Which age groups and cities generate the most revenue?

Key Metrics

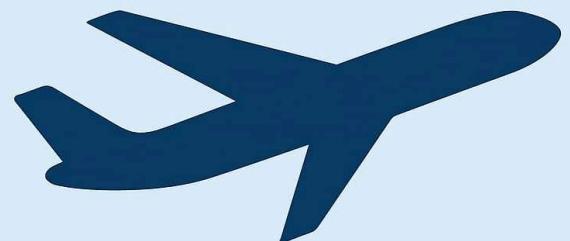
- Total Flights: 100
- Total Passengers: 1000
- Total Revenue: 41.21M
- Avg Revenue per Flight: 412K
- Avg Revenue per Passenger: 41.2K



Power BI

AIRLINE DASHBOARD

Power BI Project



Data Source: This dashboard is based on a synthetic airline dataset, generated for educational and portfolio purposes.

Data Preparation & Modeling

Data Cleaning Steps

- Removed duplicates from passenger and flight datasets.
- Standardized the column names.
- Converted text-based numeric fields (revenue) into proper datatypes.

DAX Measures and Columns

Columns:

```
Total Revenue =  
(Revenue_Data[Ticket_Sales]+Revenue_Data[Cargo_Revenue]+Revenue_Data[Food_Revenue])
```

Measures:

```
Total_Revenue = sum(Revenue_Data[Total Revenue])
```

```
Total Passengers = COUNTROWS(Passenger_Data)
```

```
Avg Revenue per Passenger =
```

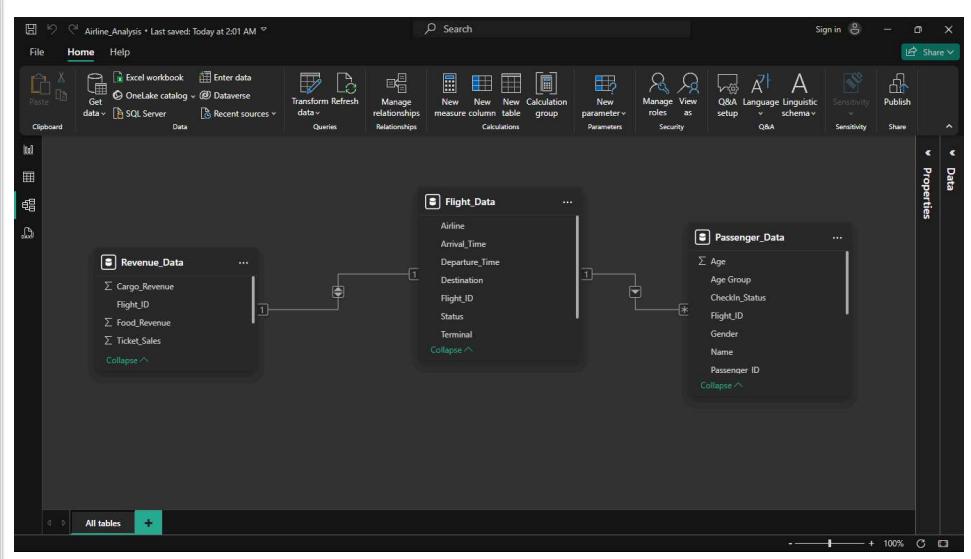
```
DIVIDE([Total_Revenue],COUNT(Passenger_Data[Passenger_ID]))
```

```
Avg Revenue per Flight = AVERAGE(Revenue_Data[Total Revenue])
```

Data Modeling

Built a star schema Model with:

- Fact Table: Flights
 - Dimensions: Passengers, Airlines, Destinations, Terminals
- Relationships:
- One-to-many between Flights to Passenger data
 - One-to-one between Flights to Airline data



Flight Operation Overview

Real-Time Airport Operation Data - Terminal, Airline, Status Insights

Airline



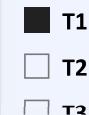
41

Total Flights

₹ 16M

Sum of Total Revenue

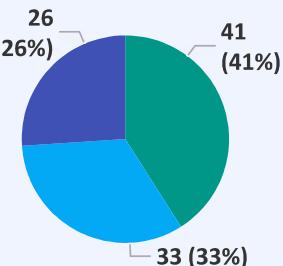
Terminal



Destination

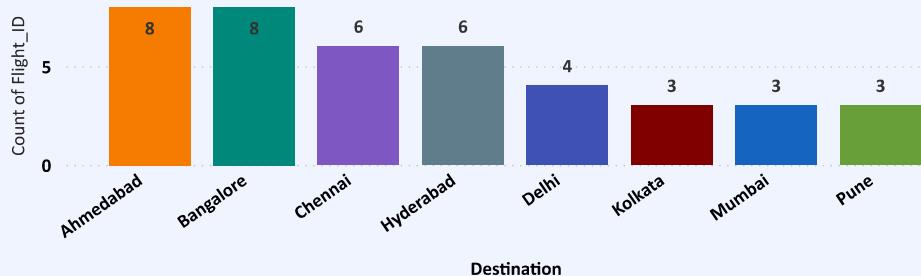
Search

- Ahmedabad
- Bangalore
- Chennai
- Delhi
- Hyderabad
- Kolkata
- Mumbai
- Pune

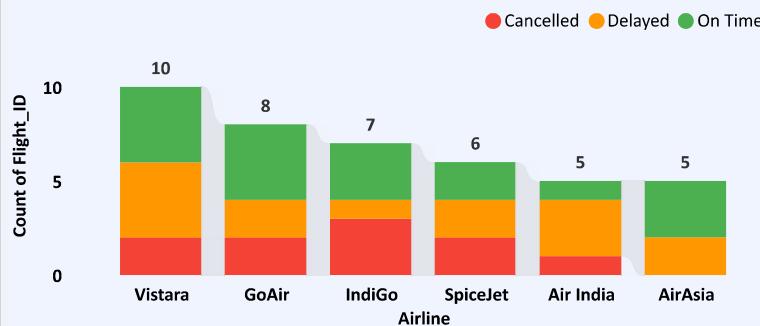


Terminal
● T1
● T2
● T3

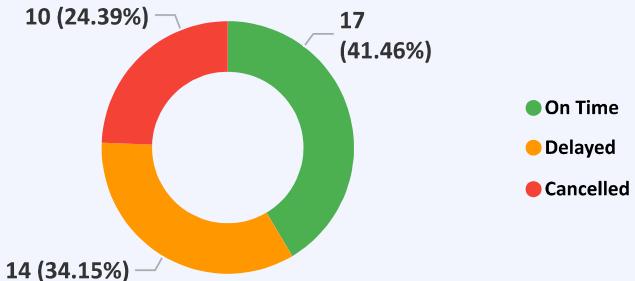
Flights per Destination City



Airline Performance by Flight Status



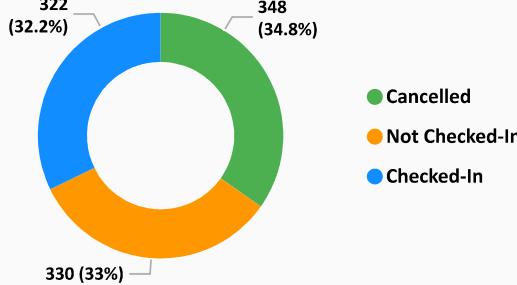
Overall Flight Status Distribution



Passenger Demographic & Behavior Insights

Passenger Profiles by Airline Demographics, and Check-in Activity

Passenger Check-In Status Breakdown



Gender

Male	
Female	
Total	

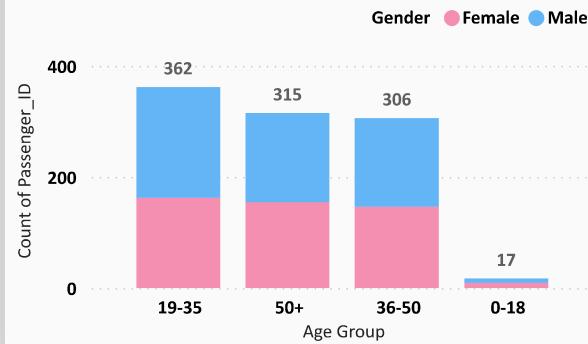
1000

Total Passengers

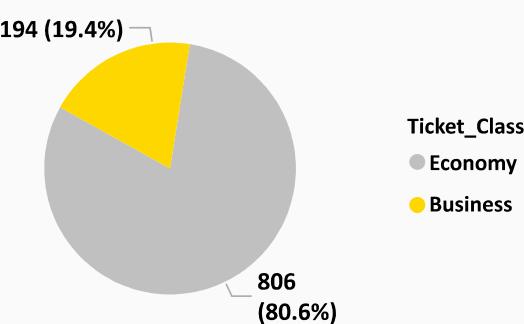
Passenger Count by Airline and Ticket Class

Airline	Business		Economy		Total
	Passenger ID	Count	Passenger ID	Count	
Vistara		42		195	237
GoAir		34		149	183
Air India		46		136	182
AirAsia		26		149	175
SpiceJet		29		92	121
IndiGo		17		85	102
Total		194		806	1000

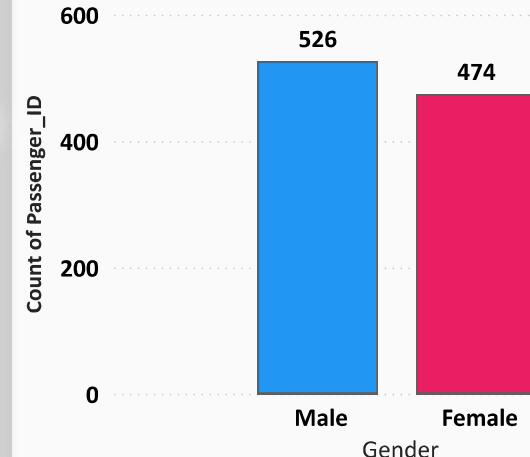
Passenger Count by Age Group and Gender



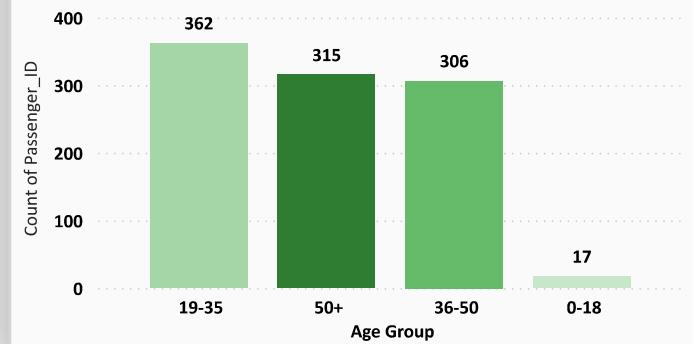
Passenger Distribution by Ticket Class



Passenger Distribution by Gender



Passenger Distribution by Age Group



Revenue Insights

Tracking Revenue Performance Across Airlines, Cities, and Age Groups

Airline

- Air India
- AirAsia
- GoAir
- IndiGo
- SpiceJet
- Vistara

₹ 41.21K

Avg Revenue per Passenger

₹ 412.09K

Avg Revenue per Flight

₹ 41.21M

Total_Revenue

Ticket_Class

- Business
- Economy

Destination

- Search
- Ahmedabad
 - Bangalore
 - Chennai
 - Delhi
 - Hyderabad
 - Kolkata
 - Mumbai
 - Pune

Sum of Total Revenue by Airline



Airline	Ahmedabad	Bangalore	Chennai	Delhi	Hyderabad	I
Air India	₹ 31,42,611	₹ 3,45,996		₹ 13,59,568	₹ 11,03,628	₹ 1,18,047
AirAsia	₹ 3,15,518	₹ 16,05,097	₹ 8,80,686		₹ 11,81,047	₹ 1,18,047
GoAir	₹ 3,81,306	₹ 10,14,136	₹ 16,49,139	₹ 6,58,021	₹ 13,91,529	₹ 1,18,047
IndiGo	₹ 5,39,430	₹ 8,53,721	₹ 5,22,471	₹ 4,93,148	₹ 5,17,377	₹ 1,18,047
SpiceJet	₹ 2,34,281	₹ 4,74,306	₹ 7,30,956	₹ 9,59,102	₹ 2,96,629	₹ 1,18,047
Vistara	₹ 28,82,206	₹ 21,94,562	₹ 10,55,630		₹ 6,90,961	₹ 1,18,047
Total	₹ 74,95,352	₹ 64,87,818	₹ 48,38,882	₹ 34,69,839	₹ 51,81,171	₹ 1,18,047

Total_Revenue by Airline and Age Group



Total_Revenue by Destination



Dashboard Summaries

Operational Insight Summary

The airline operations dashboard presents a clear snapshot of real-time data across terminals, airlines, and destinations.

Total Flights: 100

- Delayed: 36 Flights
- On Time: 34 Flights
- Cancelled: 30 Flights

Flight Distribution by Airline:

Vistara operated the highest number of flights (25), followed by Air India (19), Air Asia and GoAir (17 each), and SpiceJet and IndiGo (11 each). Each airline had a mix of on-time, delayed, and cancelled flights.

Terminal-wise Flight Distribution:

- Terminal T1: 41% of Flights
- Terminal T2: 33%
- Terminal T3: 26%

Top Destinations by Flight Volume:

Ahmedabad (19), Bangalore (15), Mumbai (14), Hyderabad (13), Chennai (12), Pune (11), Delhi (98), and Kolkata (8)

Passenger Demographic Insights

This section gives insight into the characteristics and behavior of the **1000 passengers** analyzed.

Ticket class:

- Economy: 806 Passengers
- Business: 194 Passengers

Check-in Status:

- Checked-In: 330
- Not Checked-In: 322
- Cancelled: 348

Gender Breakdown:

- Male: 526
- Female: 474

Passenger Count by Airline and Class:

Vistara, GoAir, and Air India served the most Business Class passengers, while AirAsia and IndiGo had a higher proportion of Economy travelers.

Age Group Distribution:

- 19-35 years: 362 passengers
- 50+ years: 315
- 36-50 years: 306
- 0-18 years: 17

Gender distribution is balanced across all age groups, with the 19-35 age groups being the largest segment.

Revenue Insights Summary

Total Revenue: 41.21 million

Average Revenue per Flight: 412.09K

Average Revenue per passenger: 41.21K

Top Earning Airlines:

- Air India: 9.75 million
- Vistara: 4.45 million
- other airlines generated revenue proportionally to their passenger volume.

Revenue by Destination:

- Ahmedabad: 7.5 million, Bangalore: 6.49 million, Mumbai: 6.1 million were the top contributors.
- The lowest revenue was observed from Kolkata(2.95 million).

Revenue by Age Group and Airline:

The 19-35 and 36-50 age groups were key contributors across all airlines, especially in Business Class segments

Recommendations for Airlines

Improve On-Time Performance

Insight: 36% of flights are delayed and 30% are cancelled.

Action:

- Investigate delays by airline and terminal
- Optimize ground operations at terminal T1 (highest volume).
- Improve scheduling buffers for peak hours or high-delay routes.

Upsell Business Class Tickets

Insight: Only 19% of tickets are Business Class, yet this segment contributes significantly to revenue.

Action:

- Use pricing models to encourage upgrades (dynamic pricing).
- Promote business class benefits more prominently on digital platforms.

Target High-Value Passenger Segments

Insight: The 19-35 and 36-50 age groups are the largest and most revenue-generating segments.

Action:

- Offer loyalty or bundled services to these groups.
- Use targeted campaigns

Conclusion

This airline analysis reveals clear patterns in passenger demographics, revenue contribution by airline, and age group, and destination popularity. By leveraging these insights

- Decision-making can tailor marketing strategies.
- Revenue can be optimized by focusing on profitable customer segments.

The visualizations in this report empower stakeholders to make informed, strategic decisions that drive passenger satisfaction and business growth.

Focus on High-Revenue Destinations

Insight: Top destinations like Ahmedabad, Bangalore, and Mumbai bring the most revenue.

Action:

- Increase flight frequency or premium services on these routes.
- Monitor performance for underserved but high-potential cities

Reduce Cancellations & No-Check-ins

Issue: ~65% of passengers are either not checked-in or cancelled.

Action:

- Improve digital check-in process (app notifications, SMS).
- Analyze cancellation patterns to adjust pricing or overbooking strategy.

Revenue Optimization by Airline

Insight: Vistara and Air India are top revenue earners.

Action:

- Study their service structure-apply successful practices to lower-performing airlines.
- Encourage cross-airline collaboration for shared routes or code-share agreements.