Data-Driven Aviation Risk Insights

Mathew Kaunda

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Why Risk Intelligence Matters in Aviation Expansion

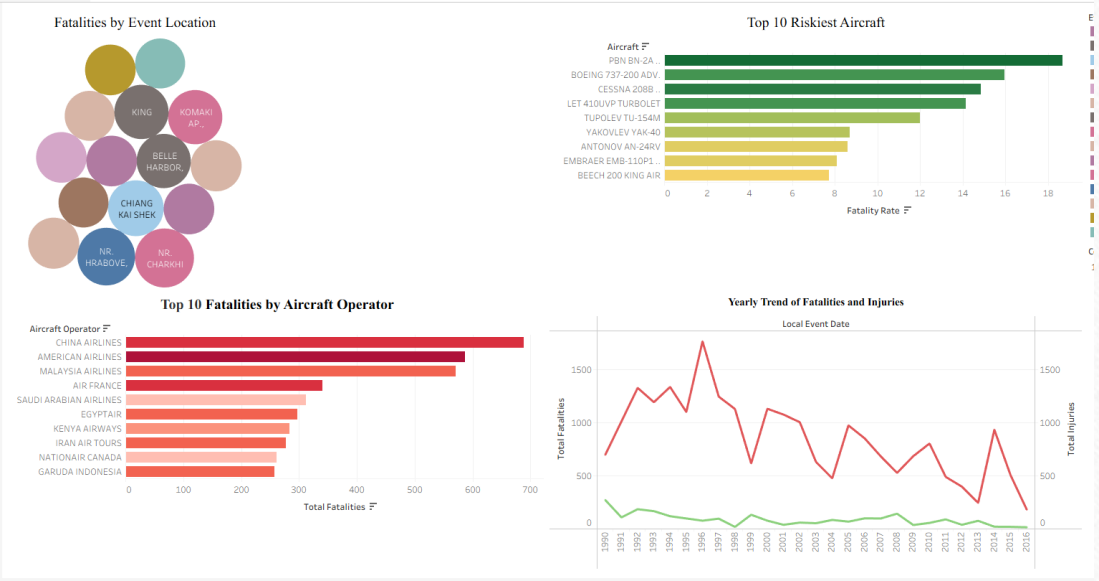
- **Challenge -** Unknown safety risks when expanding fleet operations; average fatalities per incident = 38.
- **Financial Impact -** High-risk operators/models can increase operational costs 25–40% via insurance and downtime.
- **Objective -** Analyze 607 incidents (1990–2016) to identify risk patterns in aircraft, operators, and regions.
- **Goal -** Provide 3 actionable strategies to minimize operational risk.

World Aircraft Accident Summary (WAAS) Dataset

- **Records -** 607 global events (1990–2016), including aircraft details, operators, and injury/fatality metrics.
- **Key Features -** Local Event Date, Aircraft/Operator, Crew/PAX Injuries and Fatalities.
- **Data Prep -** Standardized text, parsed dates, extracted years; no missing values.
- **Quick Stats -** Mean fatalities = 38, Max crew fatalities = 23, Max PAX fatalities = 289.

Risk Patterns in Fleet Operations

- **Aircraft -** Boeing 737-300 highest risk (>1.5 fatalities/incident); Embraer & Airbus significantly safer (<0.5).
- **Operators -** China Airlines most incidents; Philippine Airlines shows 80% lower risk.
- **Locations -** Guangzhou & Bangalore hotspots; US locations show lower severity.
- **Trends -** Fatalities spiked to 1,700 in 2001, then decreased 60% by 2016.



Strategic Recommendations

1. **Fleet Optimization -** Prioritize Embraer 170/190; phase out high-risk Boeing 737.
2. **Operator Selection -** Partner with low-incident operators; audit high-risk airlines.
3. **Operational Base -** Focus on low-risk regions (US/Europe); leverage declining global trends.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