AeroStream Operational Efficiency

Simulated Airport Monitoring & Process Improvement

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Project Overview

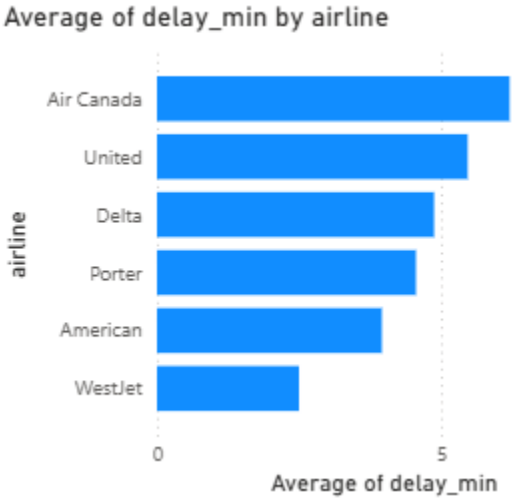
- Simulated operations monitoring at a fictional airport terminal
- Focus on check-in counter usage, passenger flow, and slot adherence
- Built with Python, Power BI, SQL, and process mapping tools
- Final goal: streamline counter allocation and reduce congestion

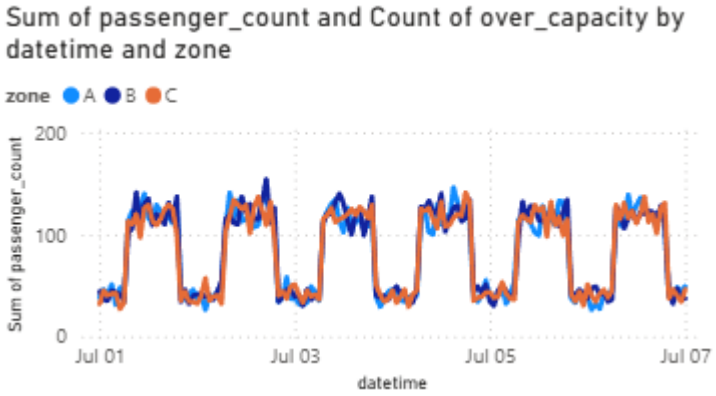
Key Insights

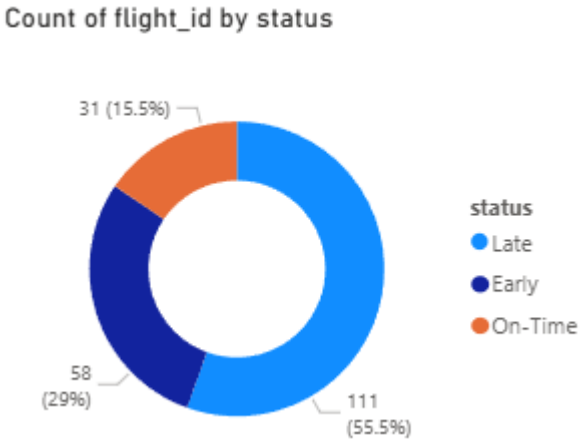
- A3 and A10 counters had sustained usage over 77.7%
- Only 15.5% of flights were on time
- 3.7% of terminal zone periods were over capacity
- Morning hours showed consistent congestion

Power BI Visuals

counter_id	July-01-23	July-02-23	July-03-23	July-04-23	July-05-23	July-06-23	July-07-23	Total
A6	55.56	66.67	88.89	66.67	77.78	72.22	77.78	72.22
A5	83.33	77.78	66.67	61.11	83.33	72.22	61.11	72.22
A1	83.33	83.33	72.22	72.22	61.11	72.22	66.67	73.02
A8	55.56	66.67	77.78	66.67	88.89	83.33	77.78	73.81
A4	83.33	77.78	66.67	83.33	66.67	66.67	77.78	74.60
A9	77.78	72.22	66.67	83.33	77.78	94.44	55.56	75.40
A2	72.22	83.33	83.33	83.33	83.33	66.67	66.67	76.98
A7	83.33	77.78	61.11	100.00	66.67	83.33	66.67	76.98
A10	83.33	61.11	94.44	66.67	77.78	77.78	83.33	77.78
A3	72.22	72.22	83.33	77.78	83.33	83.33	72.22	77.78
Total	**75.00**	**73.89**	**76.11**	**76.11**	**76.67**	**77.22**	**70.56**	**75.08**







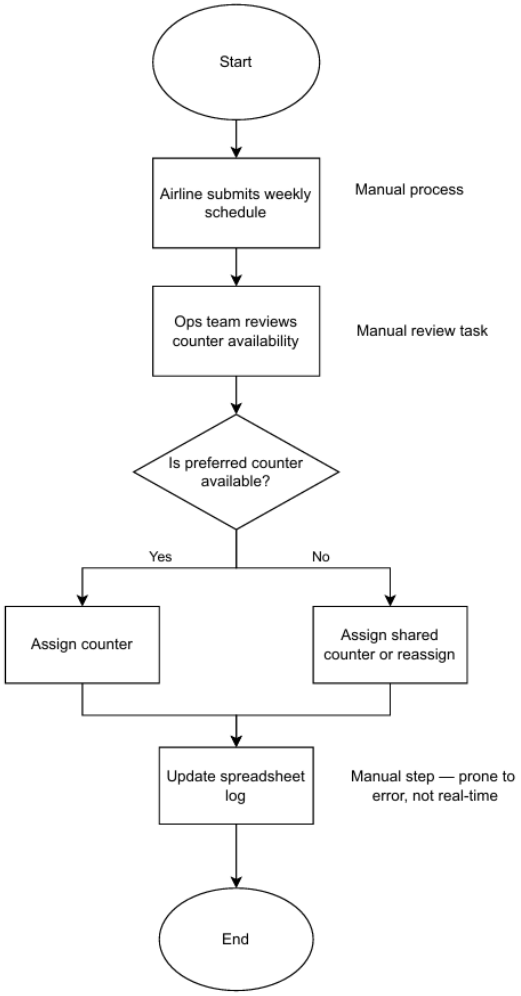
3.7%

OverCapacityRate

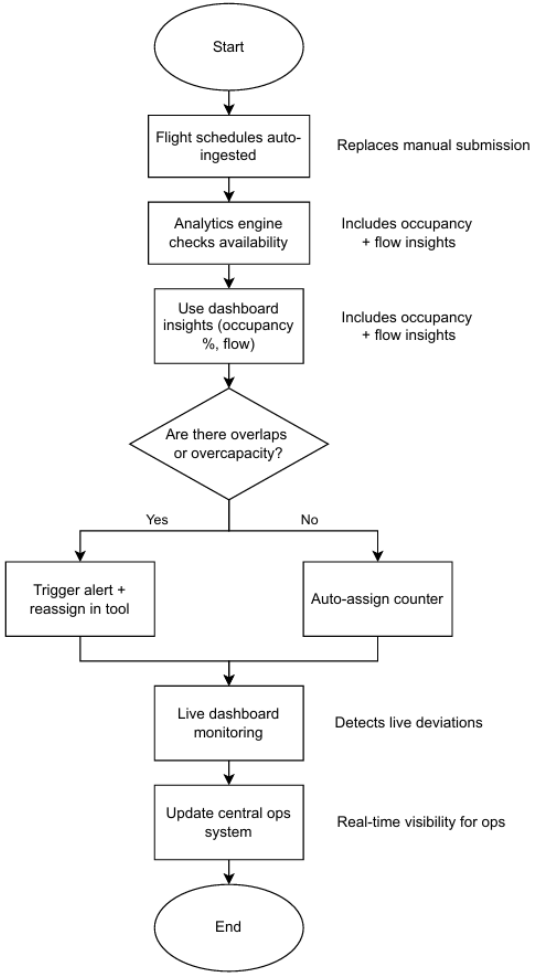
15.5%

OnTimeRate

Process Mapping (As-Is vs To-Be)



As-Is:
- Manual
- Reactive



To-be:
- Automated
- Dashboard-guided
- Real-time reallocation

Simulation Recommendations

1. Automate counter assignments using analytics
2. Use dashboards for daily ops decisions
3. Trigger alerts for counter overuse or overlaps
4. Improve flight schedule reliability with carriers
5. Replace manual logs with a centralized system

Conclusion

AeroStream demonstrates how a simulated data-driven system can:

- Reduce manual inefficiencies
- Improve resource allocation
- Enhance airport decision-making and responsiveness