AGIFORS – ATHENS 2017

OTP Evolution and Technology Leaps for Delay Cost Improvement

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SITA OTP STUDY

- 3RD Annual On Time Performance Analysis
- Global Study for Cost Estimation of Delays
- 180 airlines, 27 million of flights
- Direct Cost from Delays (Day of Operations)

ON TIME PERFORMANCE

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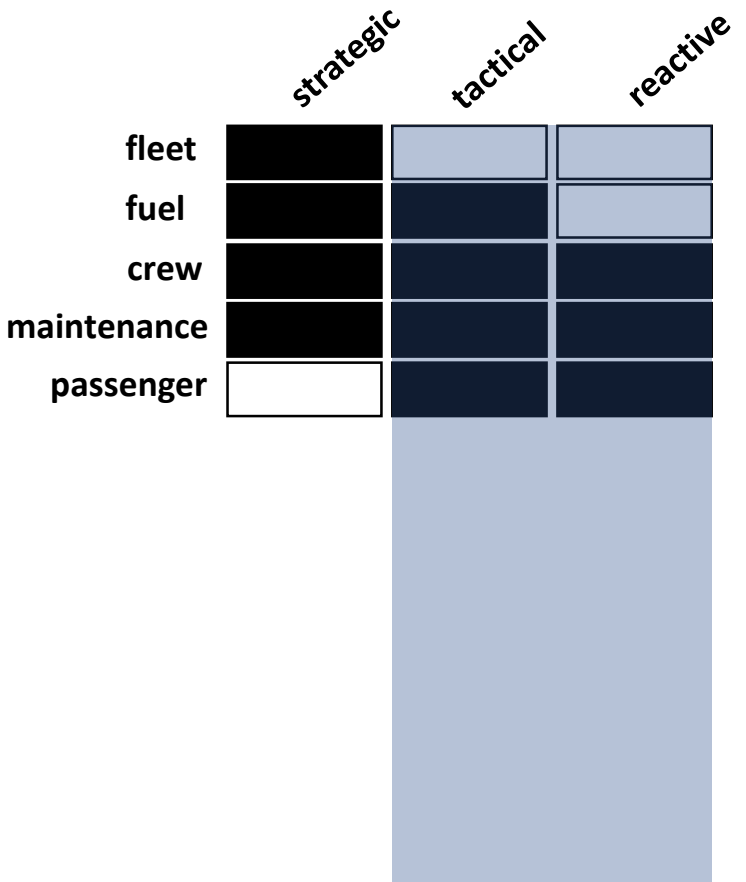
OTP STUDY APPROACH

- ✓ PUBLICLY SOURCED DATA
- ✓ COMPLETENESS VERSUS PRECISION
- ✓ TACTICAL COST OF DELAY (INCLUDES REACTIVE COST)
- ✓ DIFFERENTIATION BETWEEN TIME WHEN DELAY OCCURS:
  AT-GATE | DURING TAXI | EN-ROUTE
- ✓ COST PROXIES TAILORED PER REGIONS
- ✓ FOCUS ON AIRLINE PRODUCTIVITY AND OTP COMPETITIVENESS
- ✓ FORECASTING – CAUSAL INFERENCE AND TIME SERIES MODELLING



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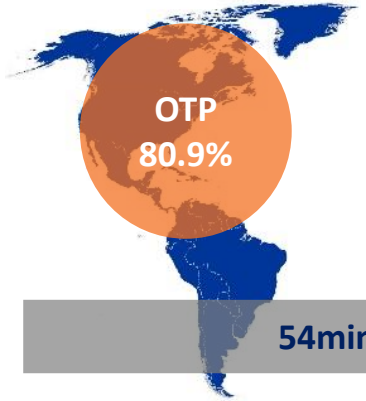
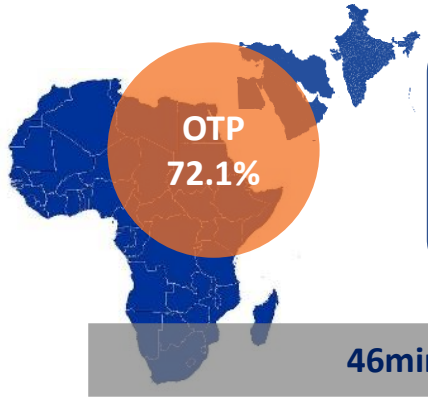
REGIONAL OTP RESULTS 2016



- 11M Flights
- $12B Total Cost of Delay

54min Average Delay Time

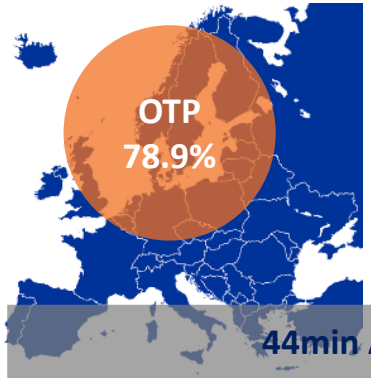
$5,586 per delayed flight



- 2M Flights
- $1.6B Total Cost of Delay

46min Average Delay Time

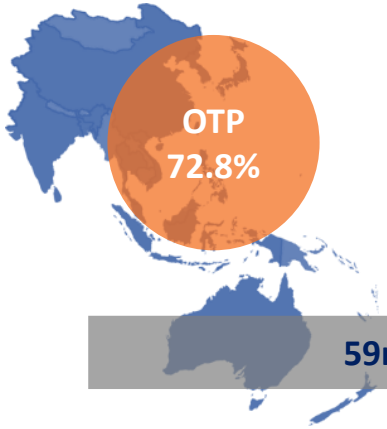
$2,790 per delayed flight



- 6M Flights
- $5B Total Cost of Delay

44min Average Delay Time

$3,981 per delayed flight



- 7M Flights
- $7B Total Cost of Delay

59min Average Delay Time

$3,527 per delayed flight

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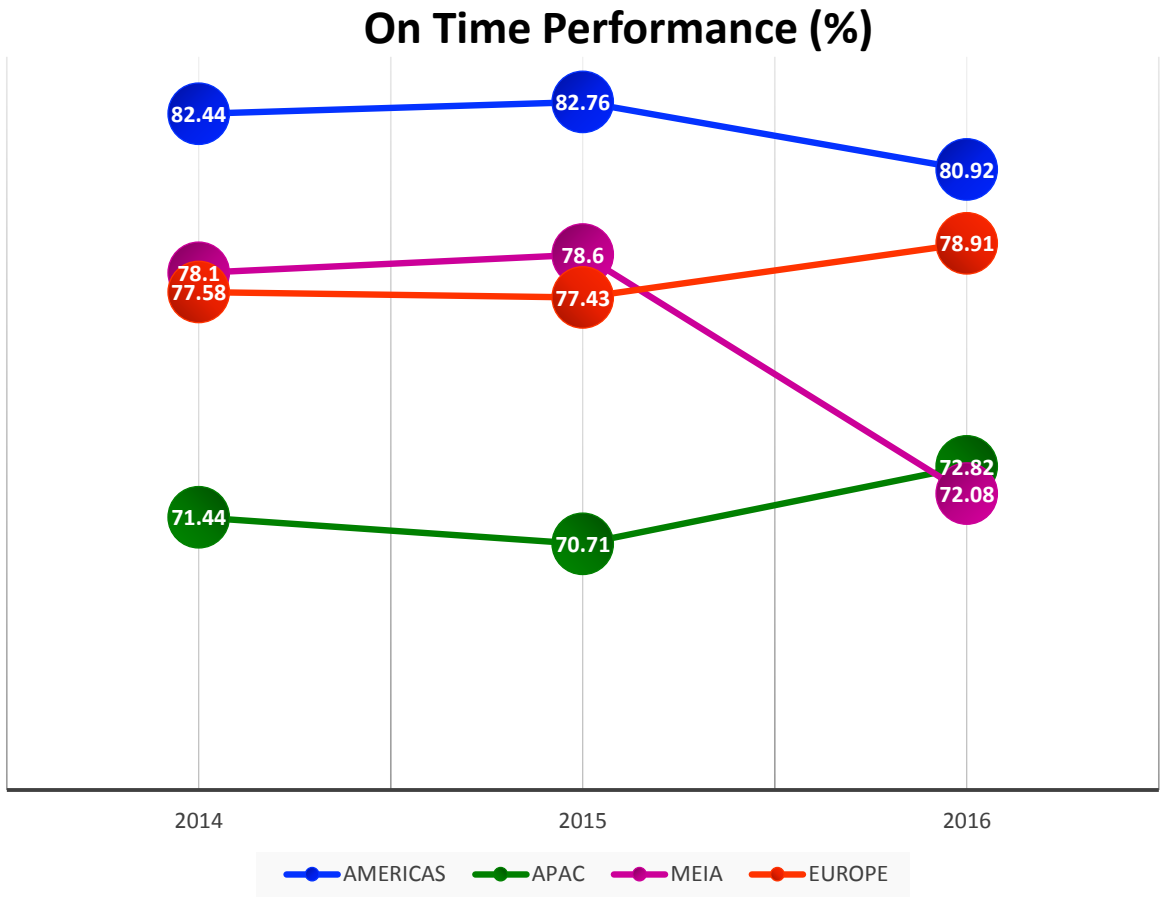
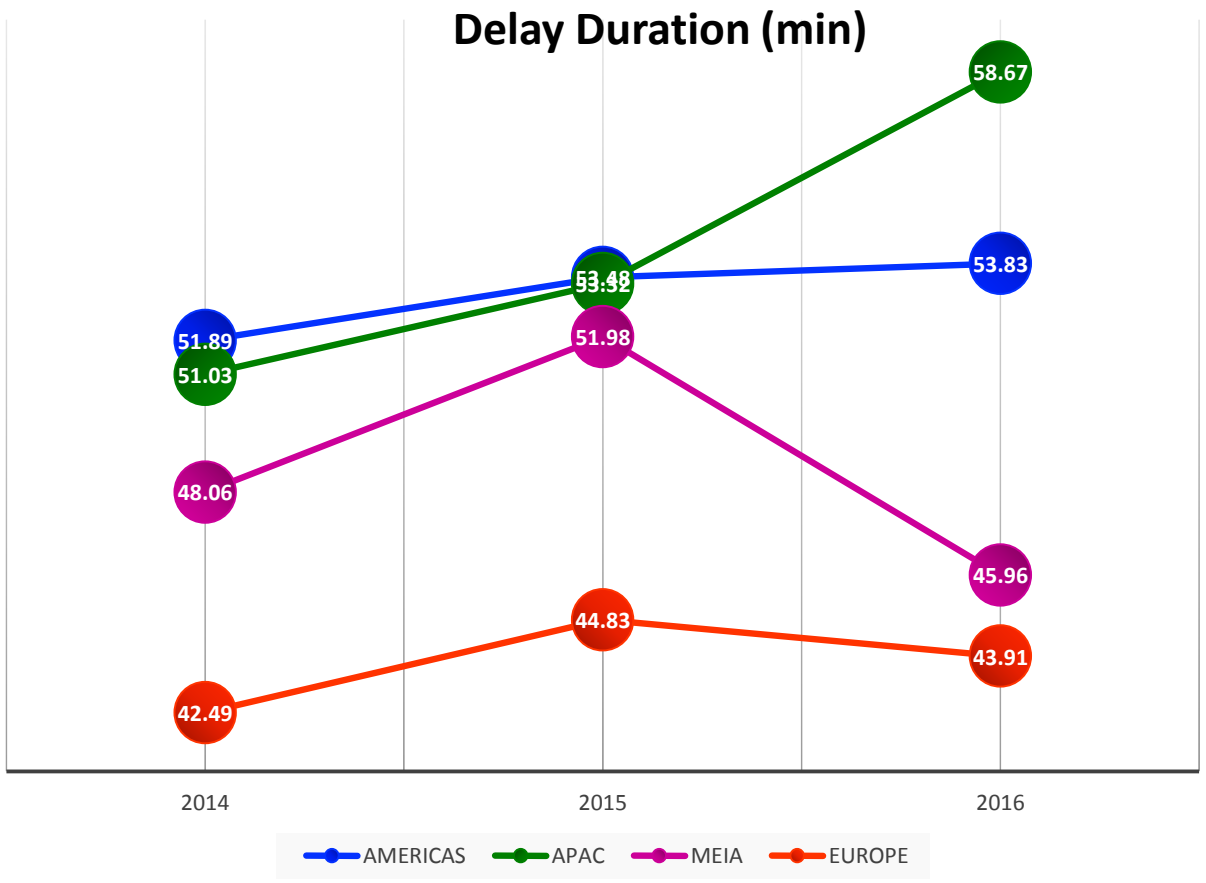
HISTORICAL OTP OVERVIEW





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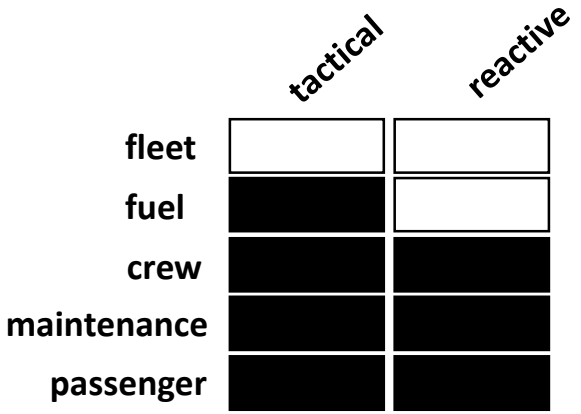
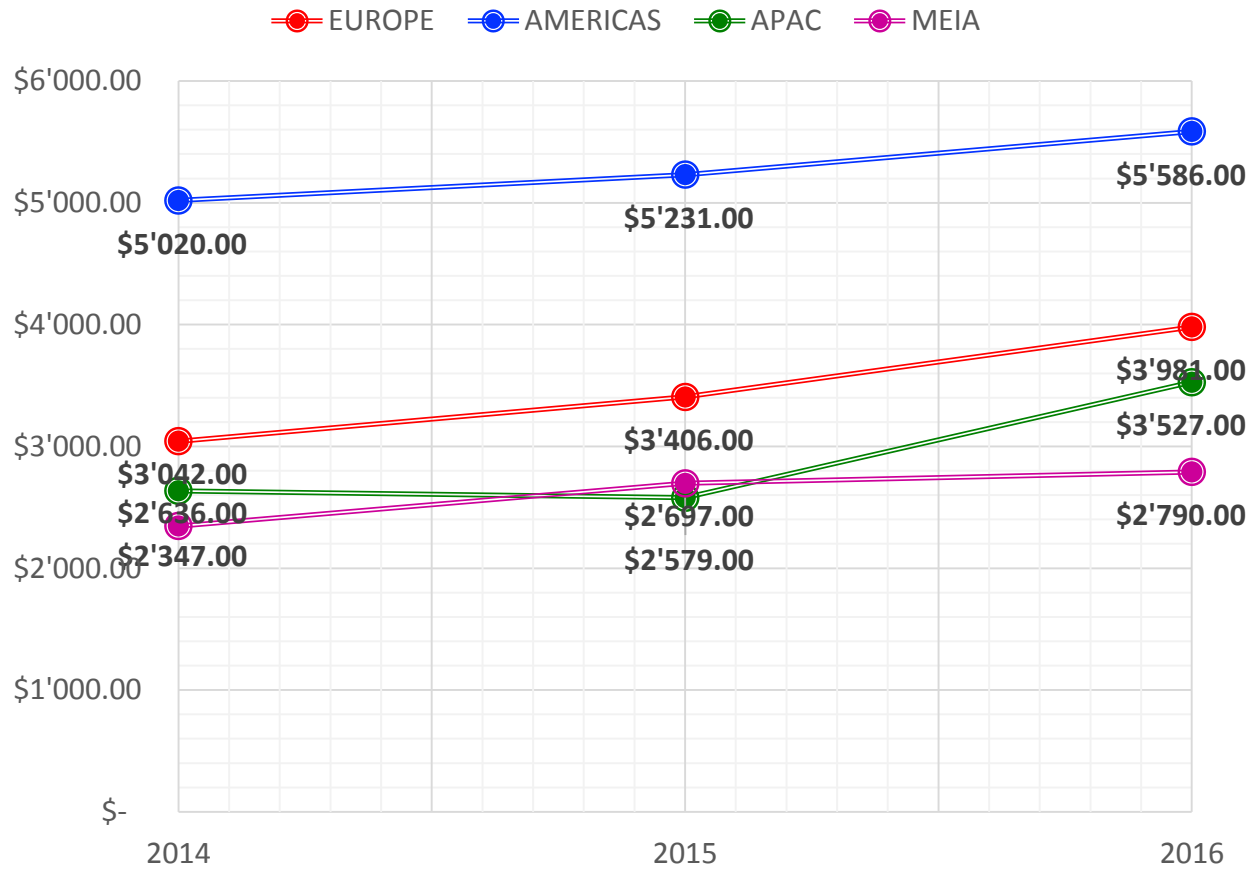
DELAY COST OVERVIEW





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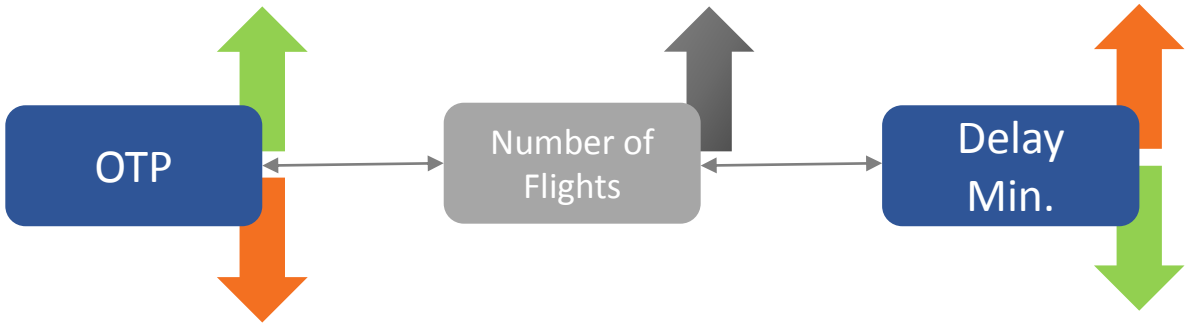
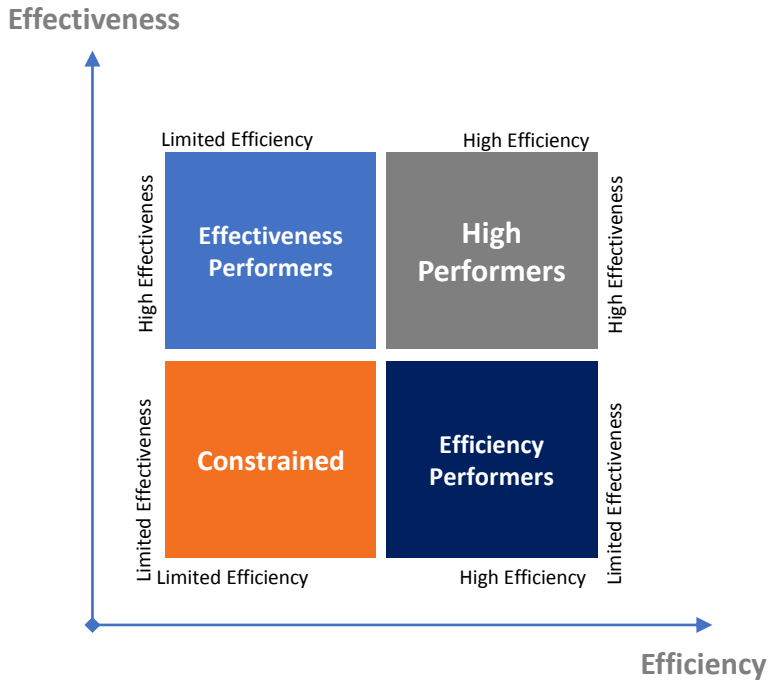
GLOBAL AIRLINES COMPETITIVENESS

OTP Effectiveness – *ability of an airline to increase the output level without increasing the average level of waste from the production process*

OTP Efficiency – *ability of an airline to increase the output level without decreasing the average level of quality of the final product*



OTP COMPETITIVENESS MATRIX



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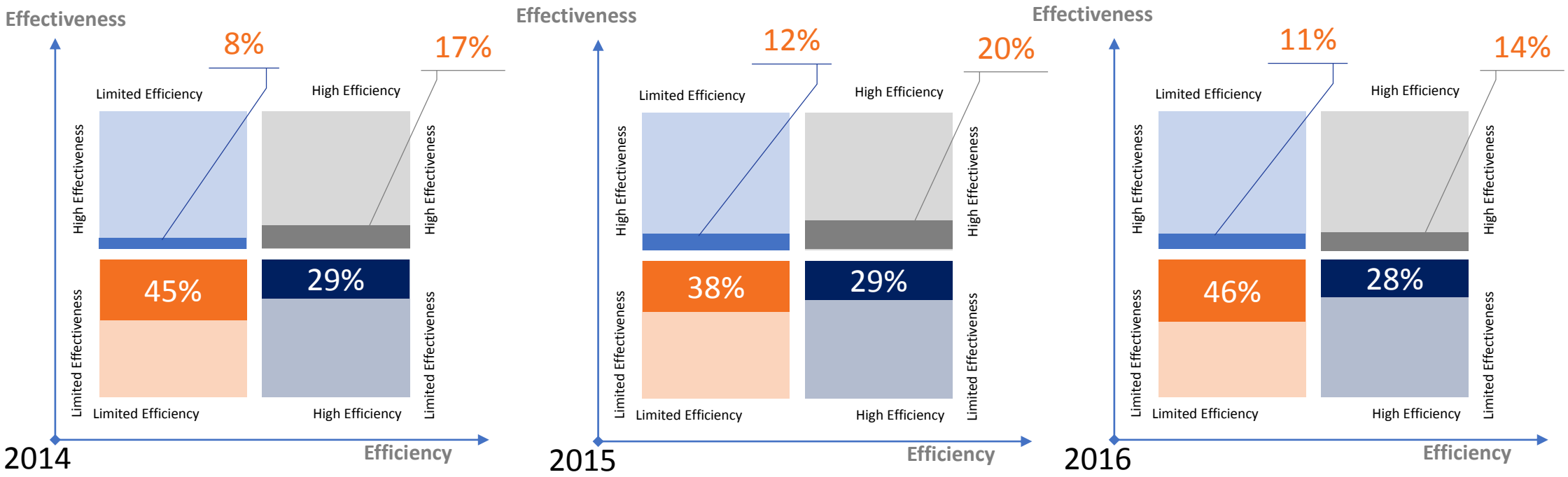
GLOBAL AIRLINES COMPETITIVENESS



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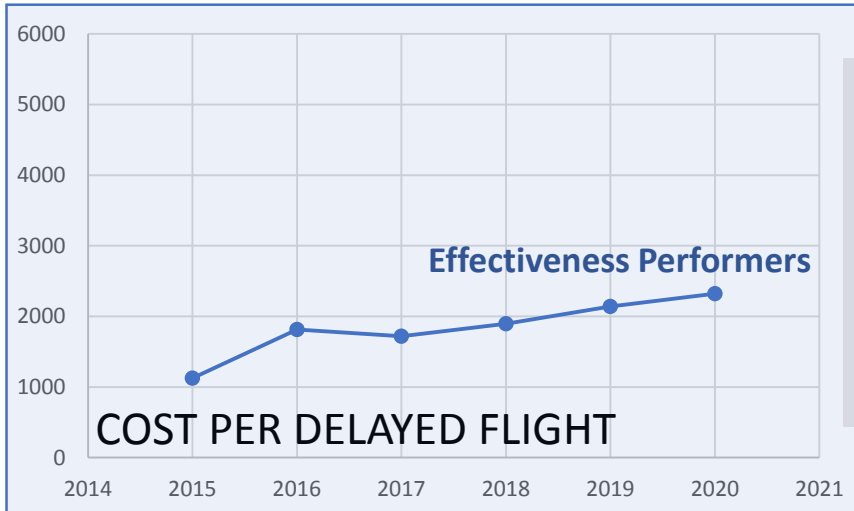
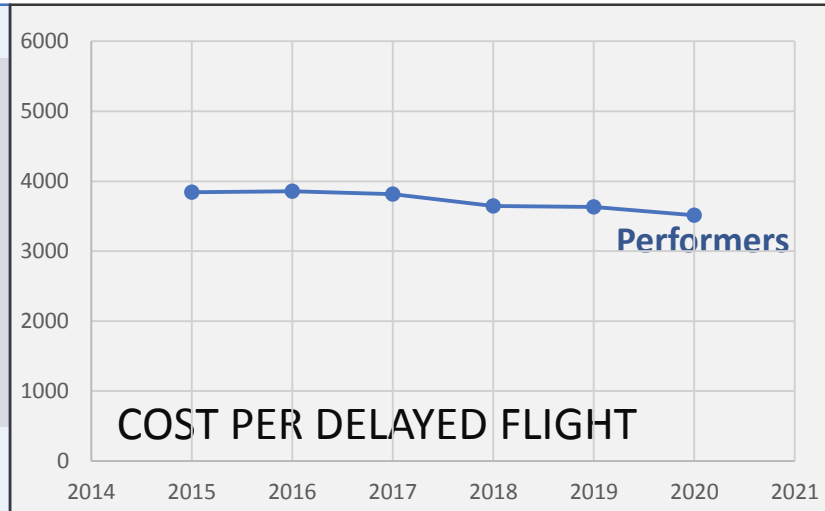
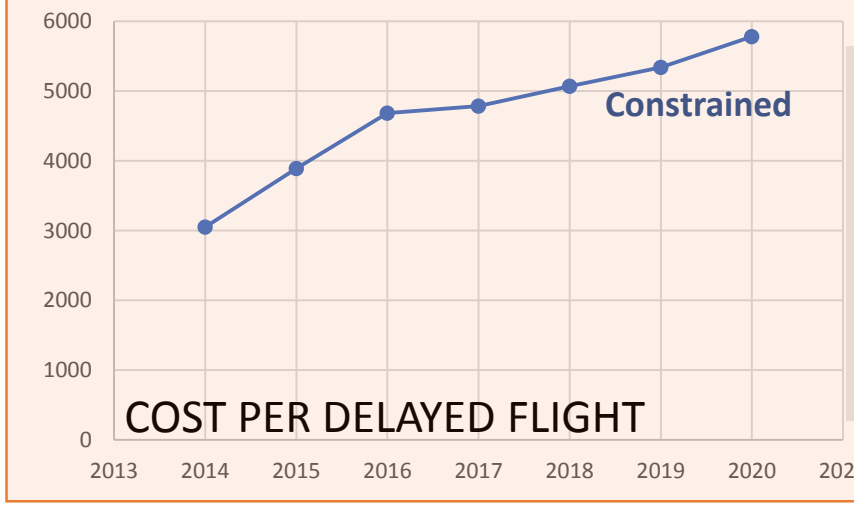
DELAY COST FORECAST



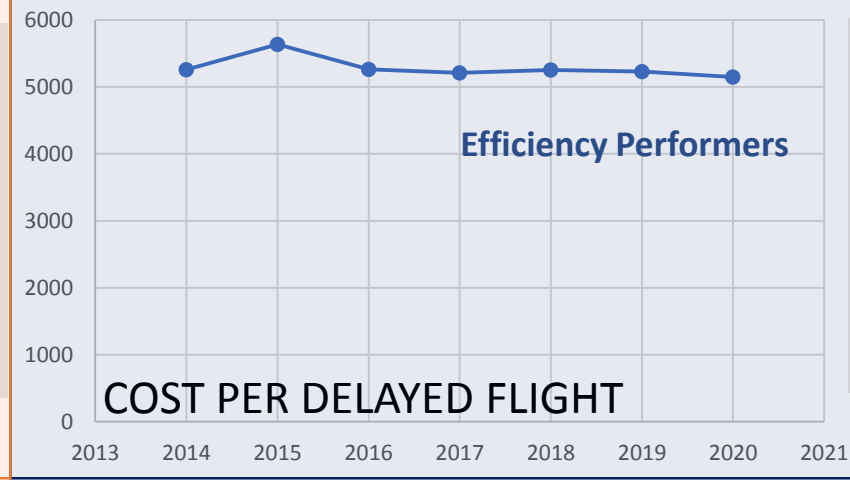
5 years evolution:
- 80% flight growth
- 3K average monthly flights
- 2p.p OTP improvement
- 7min delay duration increase
- 27% Cost of Delay Increase



5 years evolution:
- 14% flight growth
- 25K average monthly flights
- 3p.p OTP improvement
- 2min delay duration improvement
- 8% Cost of Delay Savings



5 years evolution:
- 30% flight growth
- 120K average monthly flights
- 10p.p OTP decline
- 9min delay duration increase
- 21% Cost of Delay Increase



5 years evolution:
- 12% flight growth
- 30K average monthly flights
- 4p.p OTP decline
- 3min delay duration decline
- 7% Cost of Delay Savings

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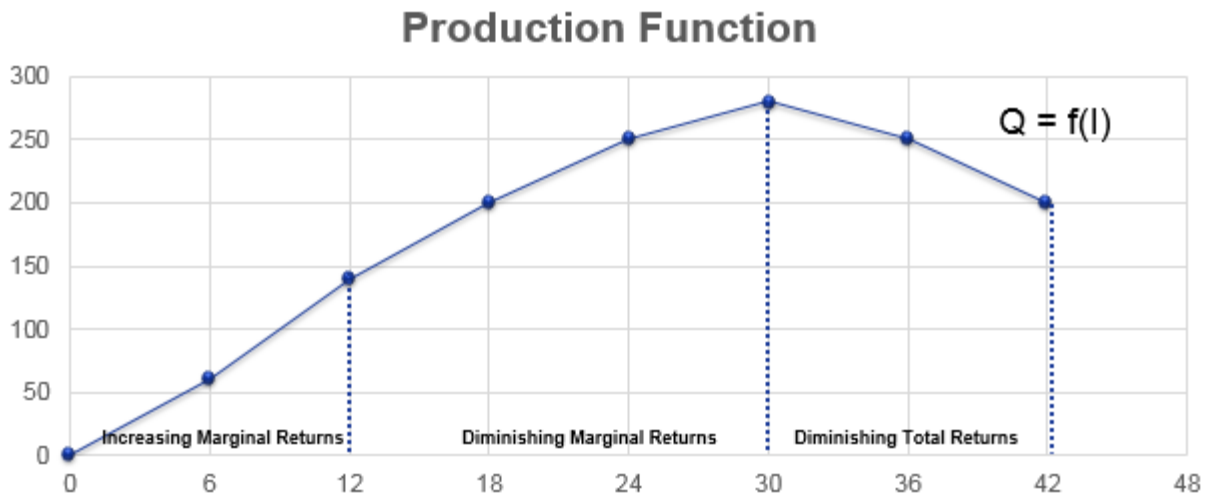
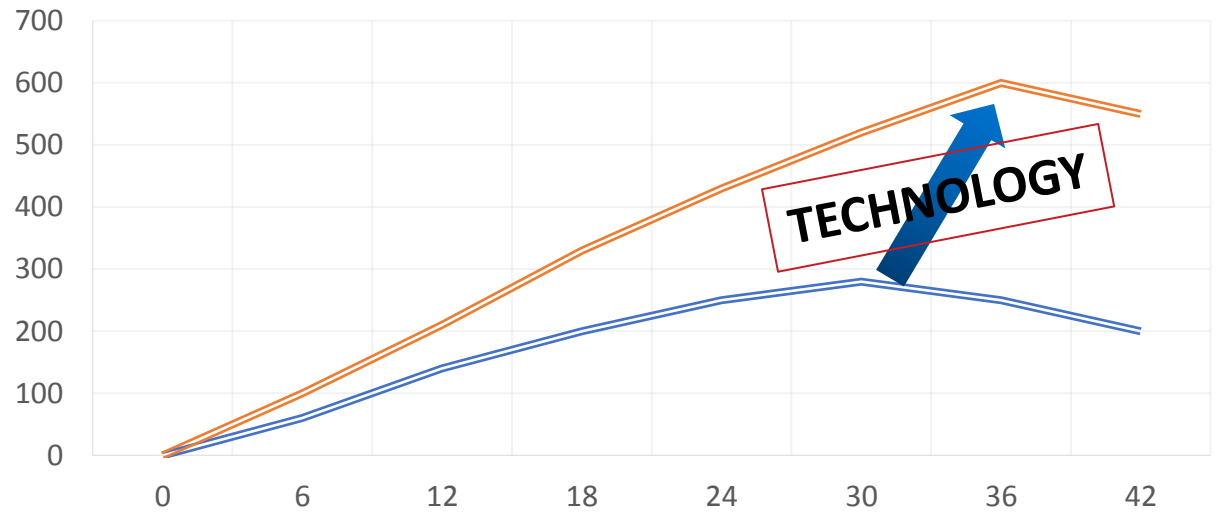
THE WAY FORWARD





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TECHNOLOGY

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FROM REACTIVE TO PROACTIVE DISRUPTION MANAGEMENT

Enterprise Planning	Network Planning	Sales & Commercial	Operations Planning	Day of Operations
• Route structure • Fleet • Bases • Facilities • Crew	• Schedule • Fleet assignments • Pricing Policies • Product Offerings	• Pricing • Yield management • Restrictions • Profitability	• Resource allocation • Tail assignments • Crew assignments	• Execute the plan! IROPS

Proactive Disruption Management

OTP / Delay Improvement ☺

Cost Improvement ☺

>18 months | 12 months | 6 months | 1 month | <1 week | Today

BI & Optimisatio — Fleet | Schedule | Pricing | Rostering

Predictive Analyti — Customer Behaviour | Customer Demand | Flight Delay Prediction

Data Lake

Flight Delay Prediction enabler for both OTP / Delay Improvement and Cost Improvement

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USER STORIES

"As an OCC manager, I want to know as soon as an aircraft tail number is assigned to a flight if and when it may experience a significant delay that may require me to do an aircraft swap"

"As an airport manager, I want to know at least a day in advance of any non-normal activity so I can optimally assign and deploy my staff"

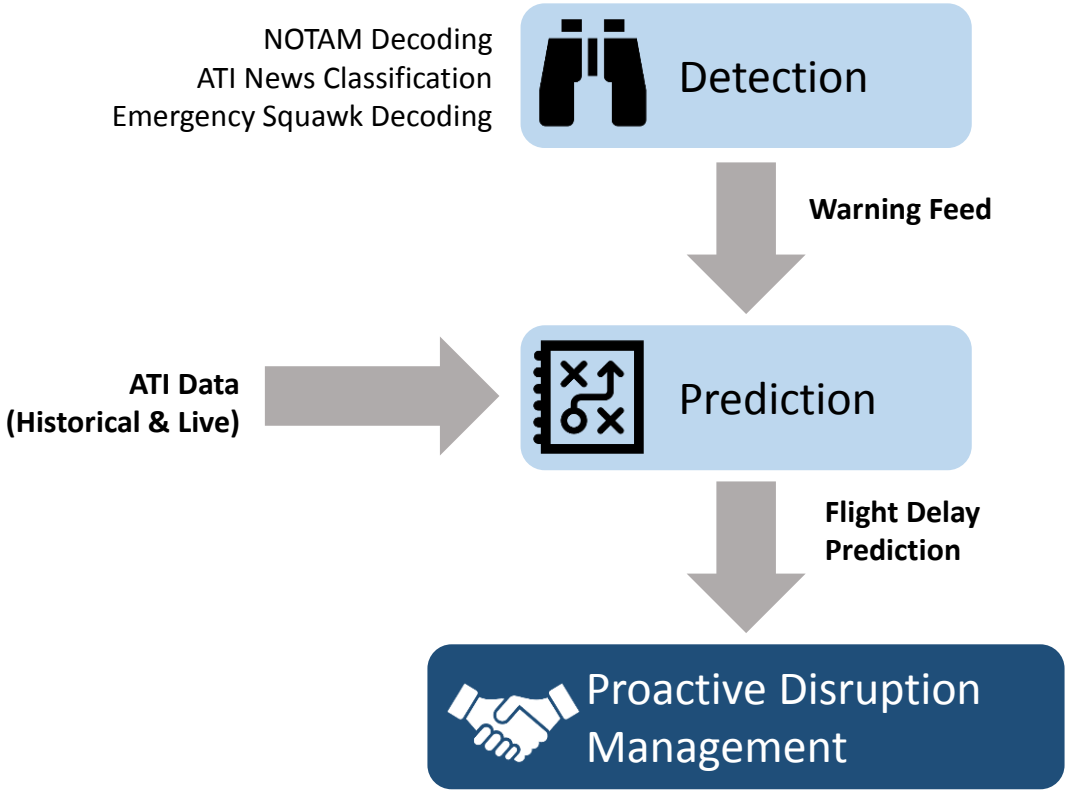
"As an OCC manager of a European airline, I want to know as early as possible when a flight may be more than 4 hours delayed (EU 261) so I can take pre-emptive action"

"As an HCC manager, I want to know at least a day in advance if I may need to re-accommodate pax with missed connections, or take very early action to stand them by on alternative flights"

"As a reservations manager, I want to know as early as possible when we may have many disrupted pax to handle so I can block book hotels at discounted rate"

The answer: "Proactive Disruption Management"

PROACTIVE DISRUPTION MANAGEMENT FRAMEWORK

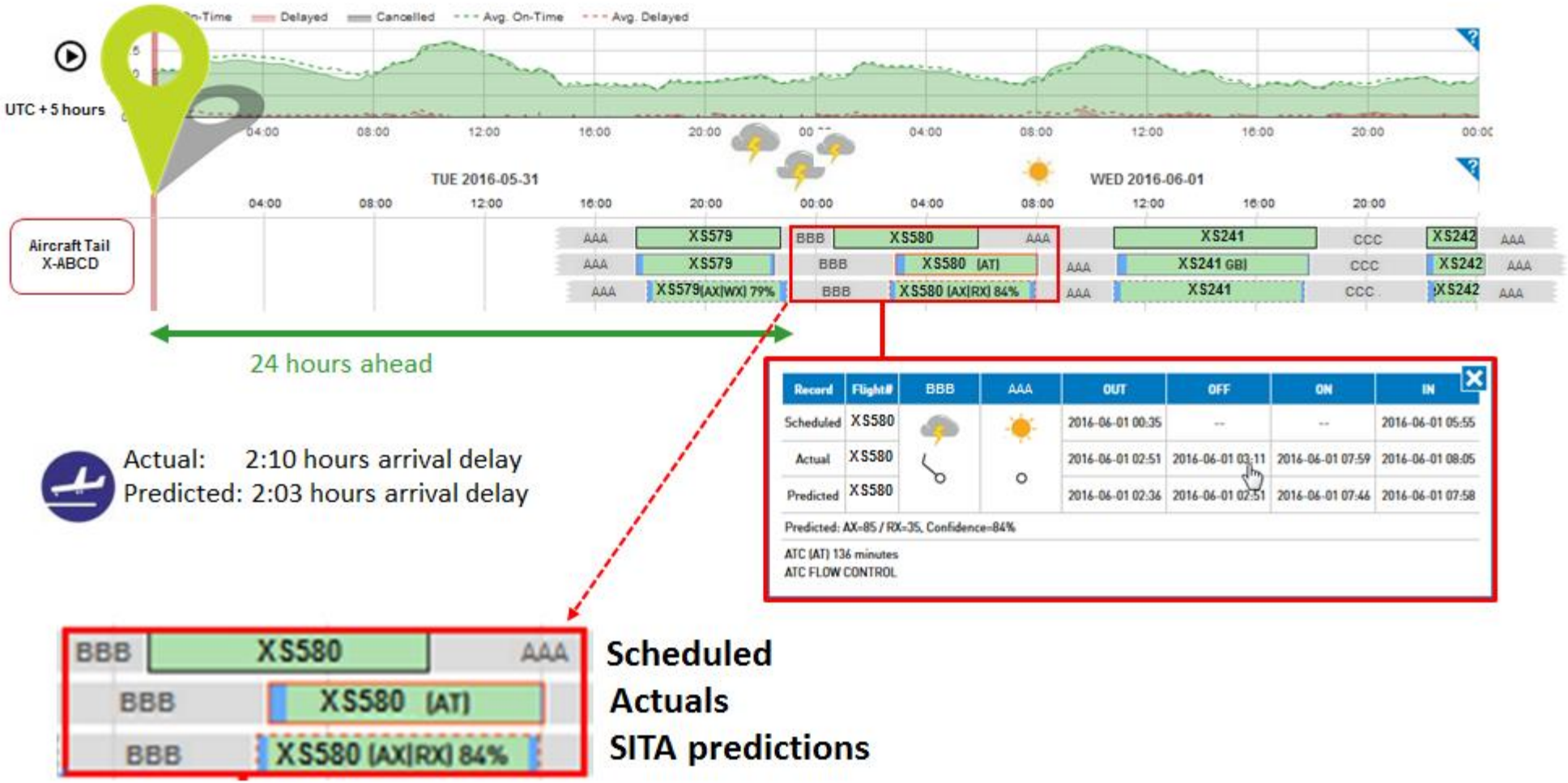


Objectives:

- **Detection:** Relay information about possible disruptions to ATI stakeholders and to prediction algorithms
- **Prediction:** Warn ATI stakeholders about flight delays up to 72 hours in advance
- **Proactive Disruption Management:** Provide different options to manage delays more effectively, improve customer satisfaction and reduce costs

Detection + Prediction = Proactive Disruption Management

PREDICTION PLATFORM



Encouraging early results from Prediction Platform

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FROM THE LAB TO THE OPS ROOM

- Delay predictions are possible!
- Requires
  - Data – more is better, both in breadth and scope
  - Domain expertise – understand data in context
  - Data Science – Selection and tuning of learning algorithm
  - Engineering – Develop a workable and integrated platform
- Contributing factors:
  - Data quality and accuracy: Significant impact
  - Delay duration: Significant impact
  - Time-to-departure: Small impact, even up to 72 hours ahead
- Business Challenges
  - Managing the shift from reactive to proactive disruption management
  - Integration with existing airline systems and processes

Feasibility demonstrated but business challenges remain

Thank You!

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