Hazard Library

MediaWiki for Safety and Hazard Analysis

Presented to: IATA Safety Data Symposium

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Date: June 20, 2018

Federal Aviation Administration

Safety Data and Analysis Team (SDAT)

- **SDAT provides agency-level direction for, and management of, all safety data throughout the FAA**

- **Through SDAT, FAA analysts:**
  - Identify data requirements and standards
  - Improve data collection methods
  - Work together on projects requiring cross-organizational expertise

Collaboration Model

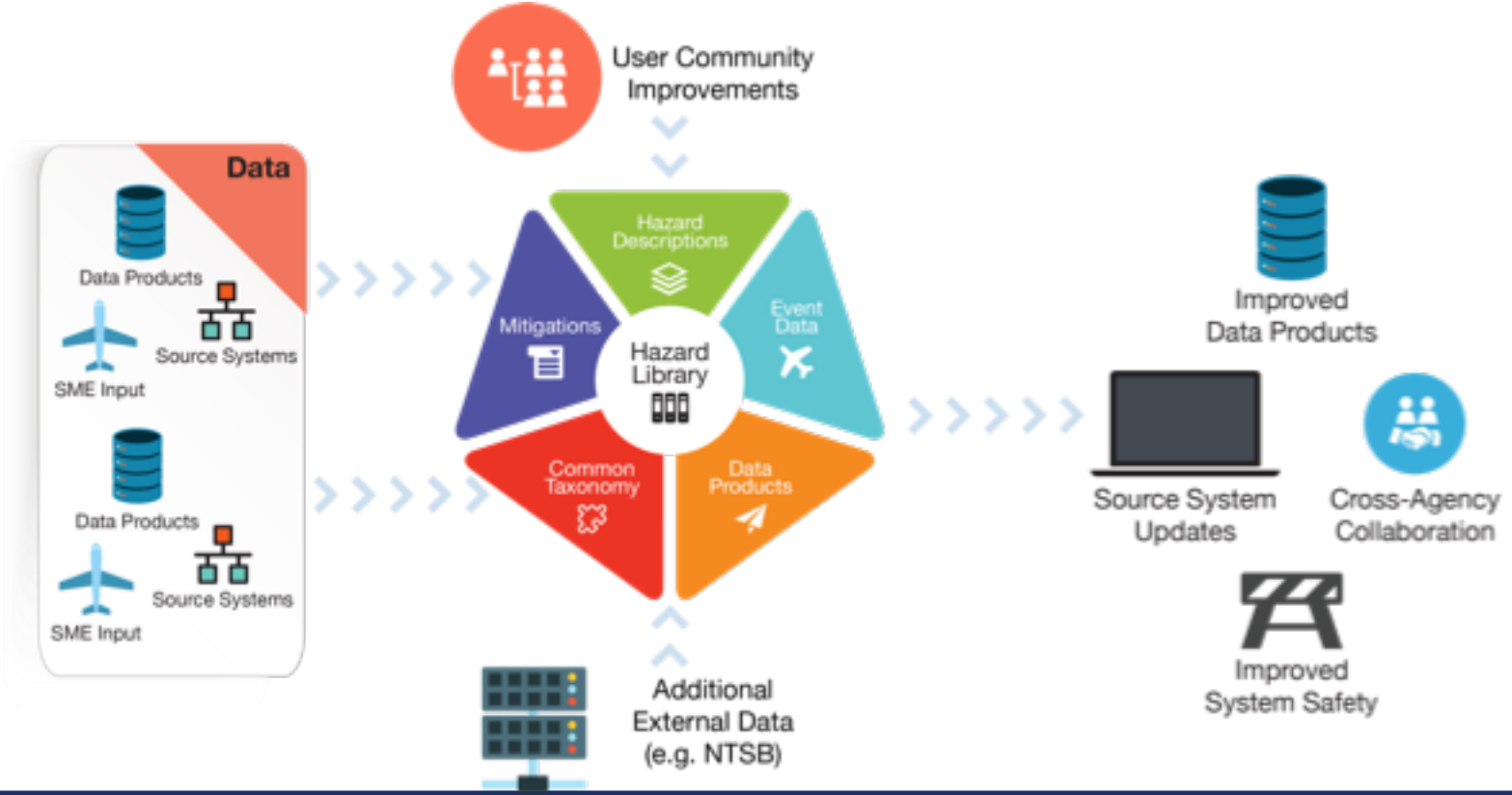
- **A product of the FAA's Safety Data and Analysis Team (SDAT)**
  - Because of SDAT, the Hazard Library has input from all safety offices
  - SDAT and the Hazard Library move the FAA towards a unified aviation safety data and analysis system

Hazard Library Concept

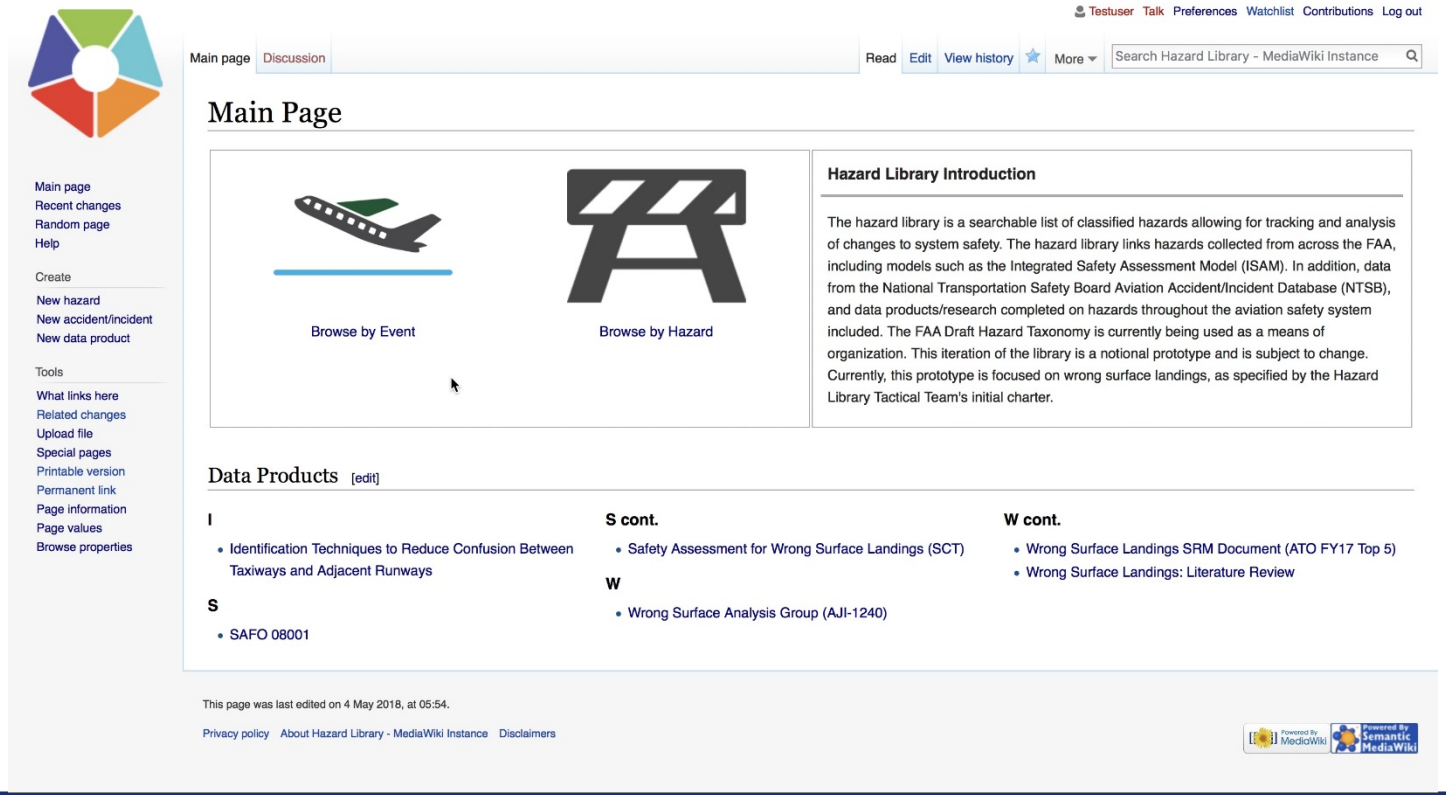
- **A centralized reference for hazard information using MediaWiki**

- **A platform ensuring FAA employees have access to all available hazard data**

Work Process



Prototype Demonstration



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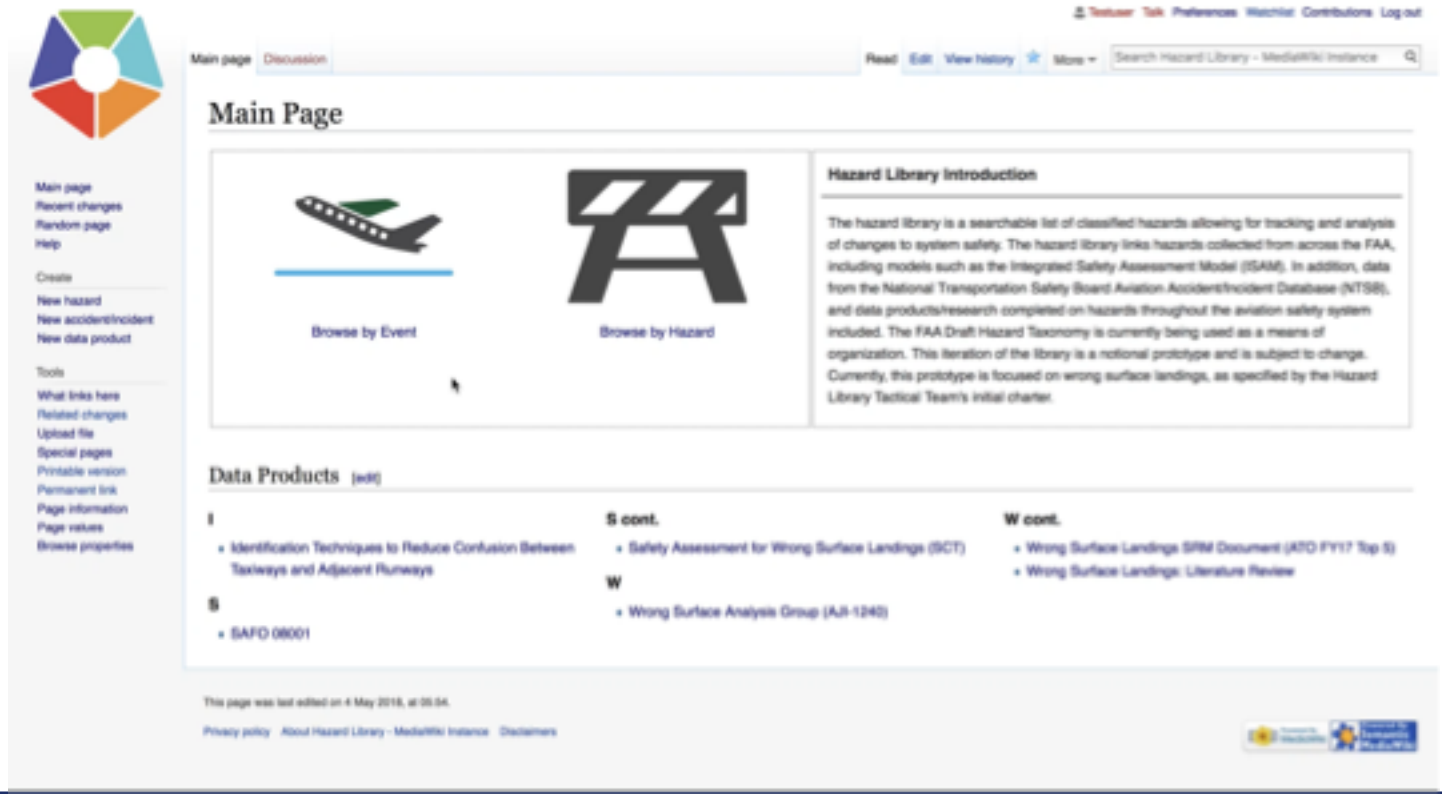

Benefits of the Hazard Library

Easy access to the following:

Unique Hazards

Probabilities of Occurrence

Probable Mitigations

Accident/Incident Queries

Data Products

Influences and informs other safety models, safety groups, and data systems

Reduces rework, improves efficiencies and encourages collaboration

A Data Driven, Risk-Based Approach

The Hazard Library, SDAT, SMS, and risk-based decision making work together to improve safety.

Questions?

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Improving Runway Safety through Data Driven Decision Making

IATA Aviation Data Symposium, Berlin 2018

Robert Graham

EUROCONTROL

David Pérez

TADOREA
KNOWLEDGE DISCOVERY FOR AVIATION

SafeClouds.eu

data beacon

Challenges

Political	regulation	citizen rights	state
Social	union	citizen protection	privacy
Economic	value	intellectual	monopolistic
Technical	standards	structure/size	multiple sources
Legal	intellectual	protection	multiple owners
Security	cyber	threat	theft
Punitive	exclusion	punishment	denial

Ignorance

we have more data than we know what to do with?

we have data?

Confidence

Safe and **secure**

A **data protection** agreement that brings confidentiality and privacy

De-sensitised / **de-identification** of your data

Verifiable restricted **access** to known partners

Clear, agreed and **auditable** use of the data

Identified approval **milestones** for you to check and agree to proceed

What is DataBeacon?

www.databeacon.aero

Some of the requirements

data beacon

Privacy by design

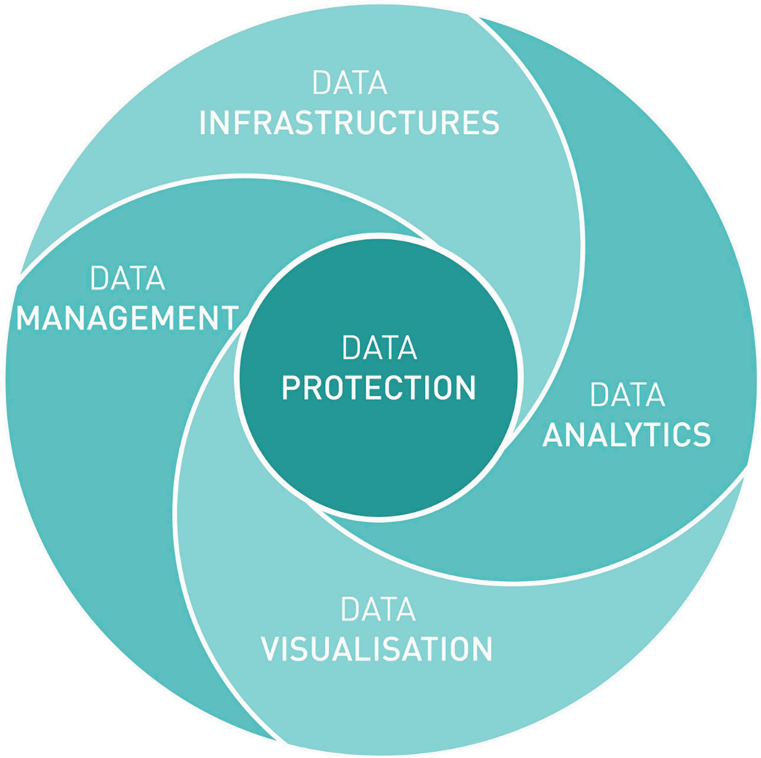
Data engineering - Security, Scalability, Flexibility

Integrated **technology** platform & **governance** model

Designed for AI applications

What is an AI platform?

data beacon



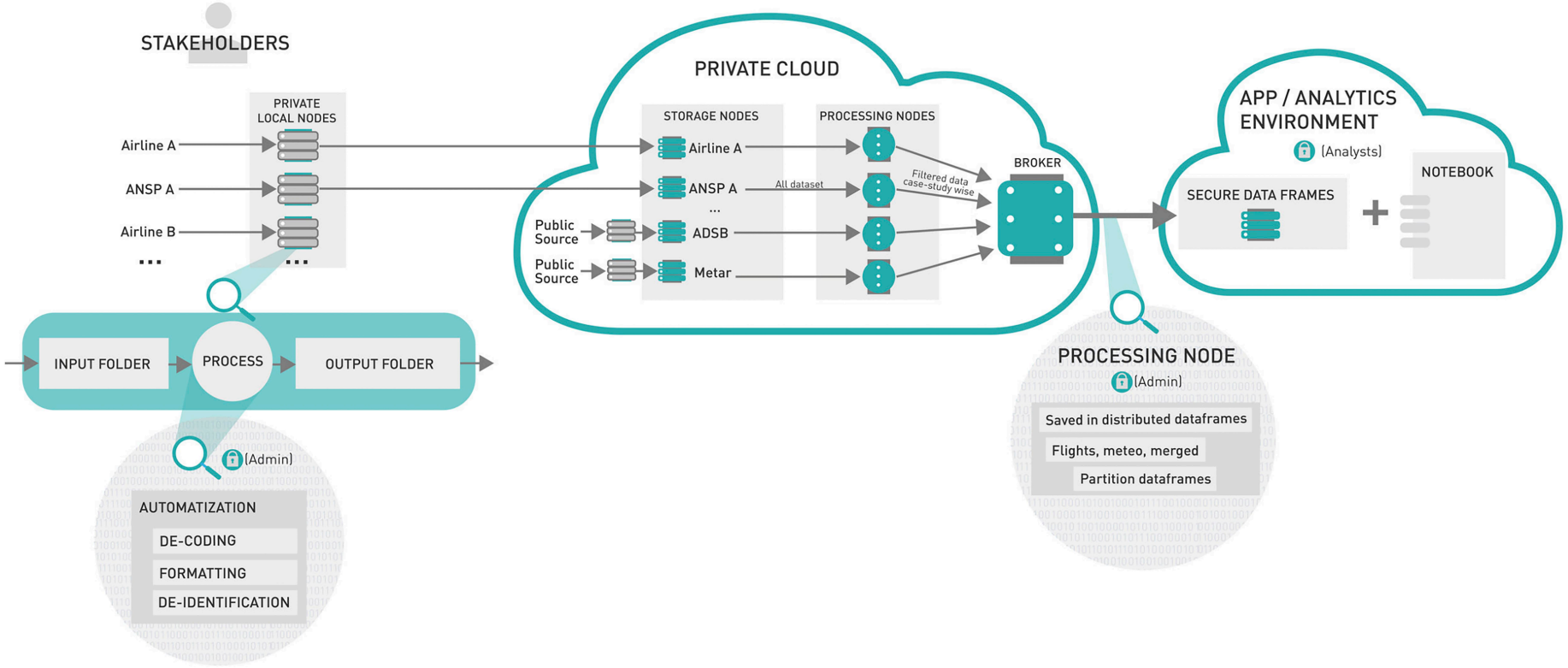
Aviation Data

- Description
- Structure and size
- Data Items description
- Range of available data
- Acquisition
- Technical limitations

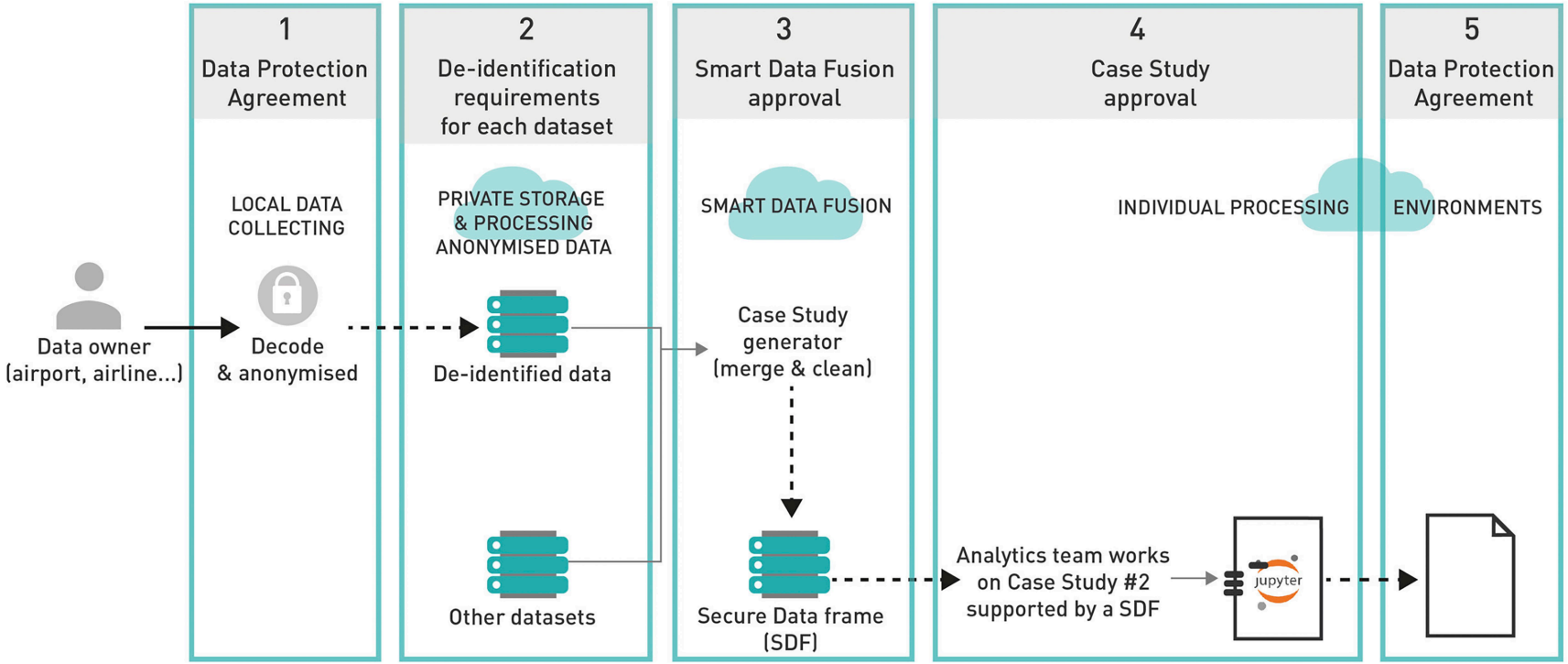
Privacy by design

Secure Data Fusion and application sandboxing

data beacon



Integrated technology platform & governance model



Jupyter notebooks

Secure multi-party computation

data beacon

Distributed storage & processing

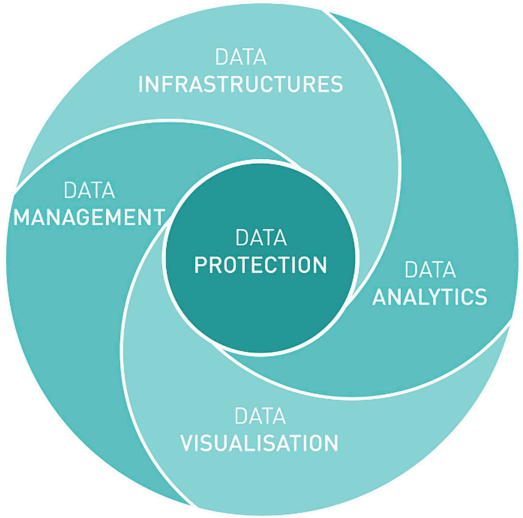
auto-scaling

real-time broker

feature engineering

Apache Kafka

descriptive analytics



crypto de-id

predictive analytics

Apache Spark

DevOps env

sandboxed apps

de-coding, parsing, cleaning

GitLab

true-blind benchmarking

Secure Data Fusion (SDF)

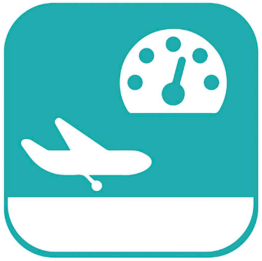
integrated dashboards

Collaborative apps

data beacon

Airprox

Separation with terrain



SafeRunway

Level bust

Hard landing

Wake vortex separation

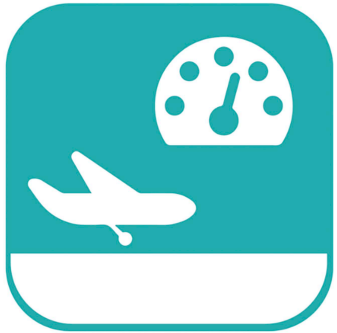
Congestion monitoring

Unstable approach

SafeRunway

Manage runway occupancy to safely increase runway throughput

Providing additional access to constrained resource – the runway



SafeRunway

What are we talking about?

Geography

Runway Configuration

Aircraft Type

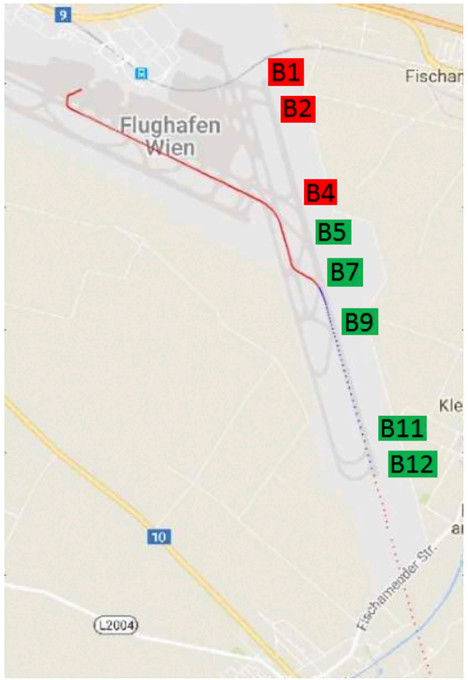
Company Policy

Pilot and controller

Weather

Day

Data



Large historical dataset

Deep **understanding** of contributing factors

What happened?
What's happening?
Descriptive analysis

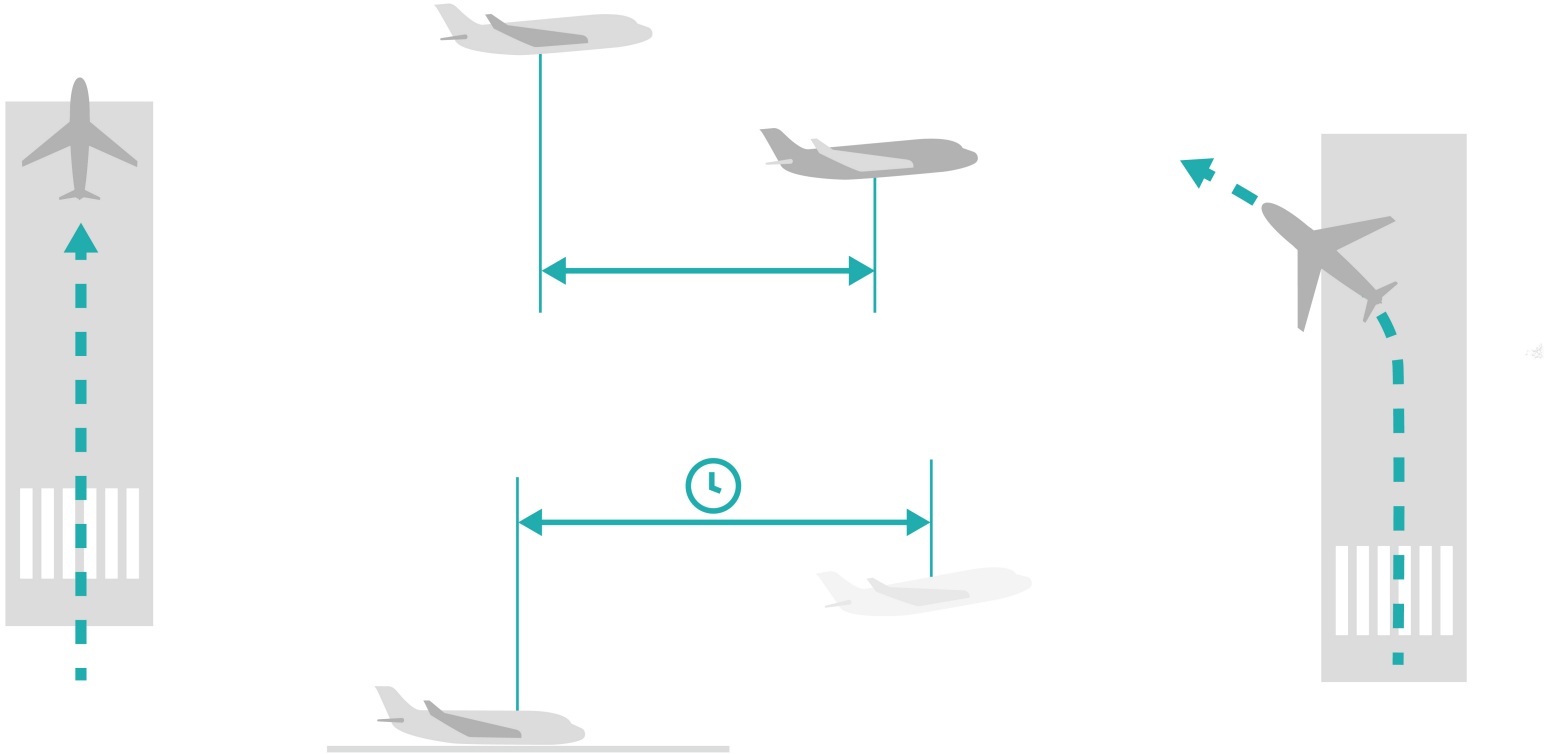
Automatic and precise **prediction** of traffic behaviour impacting runway performance

What will happen?
Predictive analysis

Effective **mitigation**

What should we do?
Solution analysis

Real Time Data Driven Predictions



The SafeRunway app is a predictive AI engine to safely drive runway throughput

Safe reduction of separation

Full use new wake minima

Optimised time based separation

Reduction in go-around

Additional throughput

An ecosystem of partners collaborating together

Overcoming the data challenges

Building confidence to do business

A secure common data platform in place

data beacon

www.databeacon.aero

Secure ownership and control

Increased data quality

Smart Data Fusion

Solving the "cold start problem"

Let's talk about partnerships and applications

Thank you!

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