EASA
European Aviation Safety Agency

Sharing and processing safety data: a vital step forward for safety?

Moderator

Panellist

Erick Ferrandez

Dirk Polloczeck

President, **European Cockpit Association**
Flying Airbus 320 for Lufthansa

John Monks

Head of Aviation Safety,
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Panel 6

Carlos Alvares Pereira

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Head of Product Safety Enhancement,
Airbus

Your safety is our mission.

An agency of the European Union

New IT Technologies available

MACHINE LEARNING

TEXT MINING

ARTIFICIAL INTELLIGENCE

HIGH SPEED COMPUTING

Aviation sector and data

Generate Terabytes of data every day

Strong culture of safety reports

A mature community

"Just Culture"

Can Big Data deliver?

Can we protect the data?

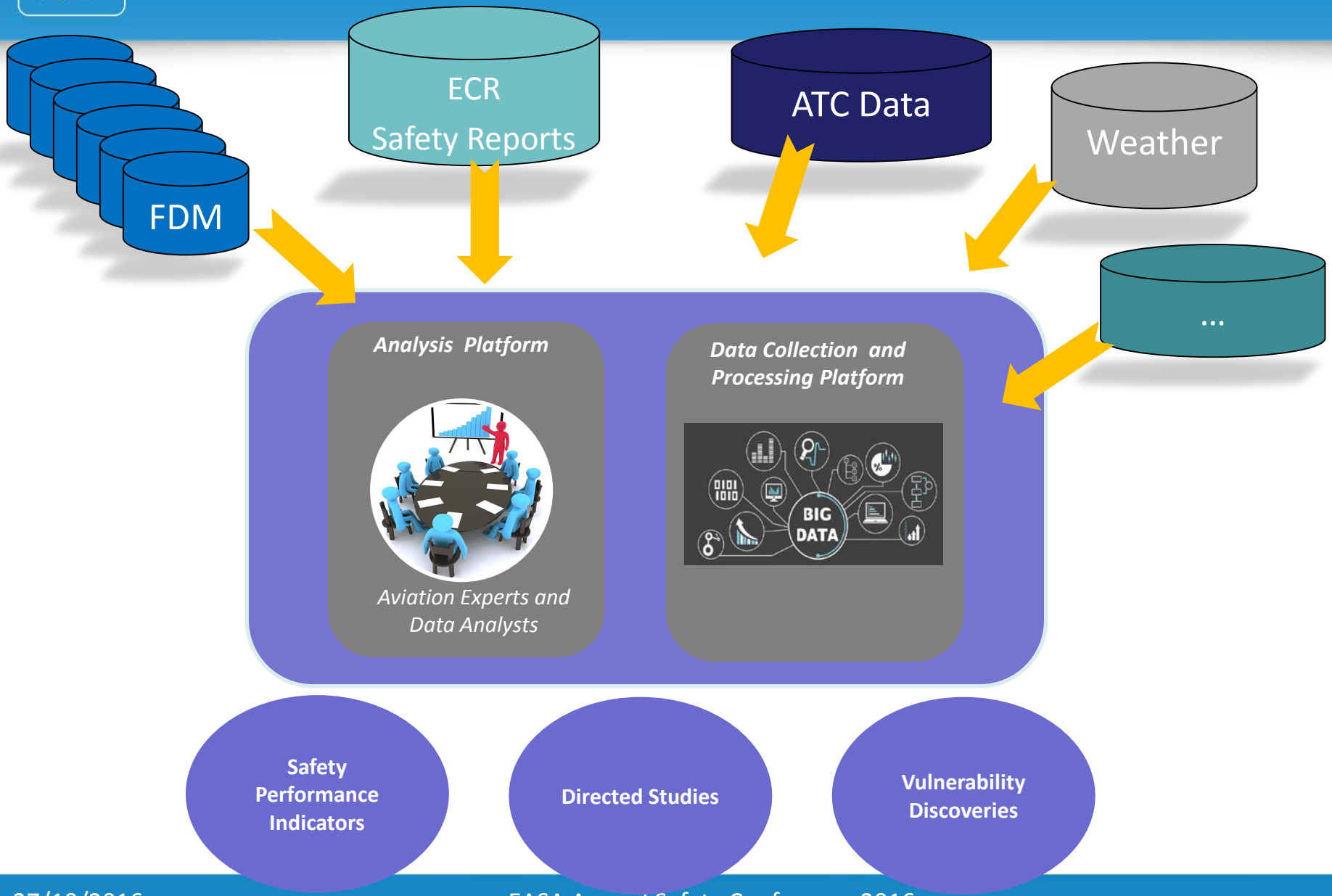
Way ahead for safe civil aviation

"Know where to look"

"See it coming"

Need for intelligence, assembly of data and serious analytical capacity

The **Data4Safety** Programme



The **Data4Safety** Programme

A **voluntary** and **collaborative** partnership amongst all stakeholders

A Big Data Platform to collect and process Safety Data

An Analysis Platform gathering experts from industry and states

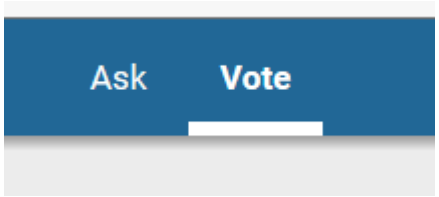
Outcome shared for the benefit of the whole community

Independent governance to reflect the partnership and collaborative approach (dual management authorities/industry)

Live polling

- In your views, the new IT technologies (Big Data and advanced analytics) can…
  - **not** improve safety further. (This is a distraction)
  - improve our understanding of the safety system (help us to “know where to look”)
  - provide a tool to go predictive (help us to “see it coming”)

- In your views, you trust that the new IT technologies coupled with Just Culture can provide strong protection on data usage. You would share your own data in confidence to support safety.
  - Yes or No



Mastering Big Data for Safety, safely

Carlos Alvarez-Pereira

EASA Annual Safety Conference
Bratislava, 25-26 October 2016

innaxis

innovation for a complex world

Non-profit research organization

Founded 2006

Experience in EC-funded collaborative projects (coord)

Complexity Science / Network-centric Modelling / Data Science

25 projects with industry, academia and public administrations

300 scientific papers and reports

35 events organized

SafeClouds.eu

EASA European Aviation Safety Agency

AESA

AirEuropa

vueling AIRLINES

IBERIA

norwegian

PEGASUS AIRLINES

innaxis

TADOREA KNOWLEDGE DISCOVERY FOR AVIATION

EUROCONTROL

LFV AIR NAVIGATION SERVICES OF SWEDEN

CRIDA I+D+I - ATM

TUM Technische Universität München

LINKÖPING UNIVERSITY

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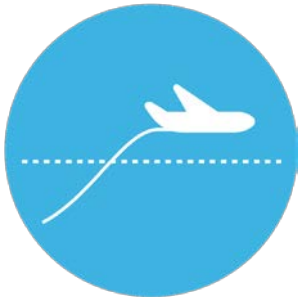
Scenarios

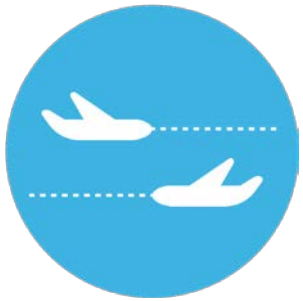
Hard landing

Lack of proper separation with terrain

Real-time congestion monitoring



Level bust



Airprox

Wake vortex separation

Runway performance

Unstable approach

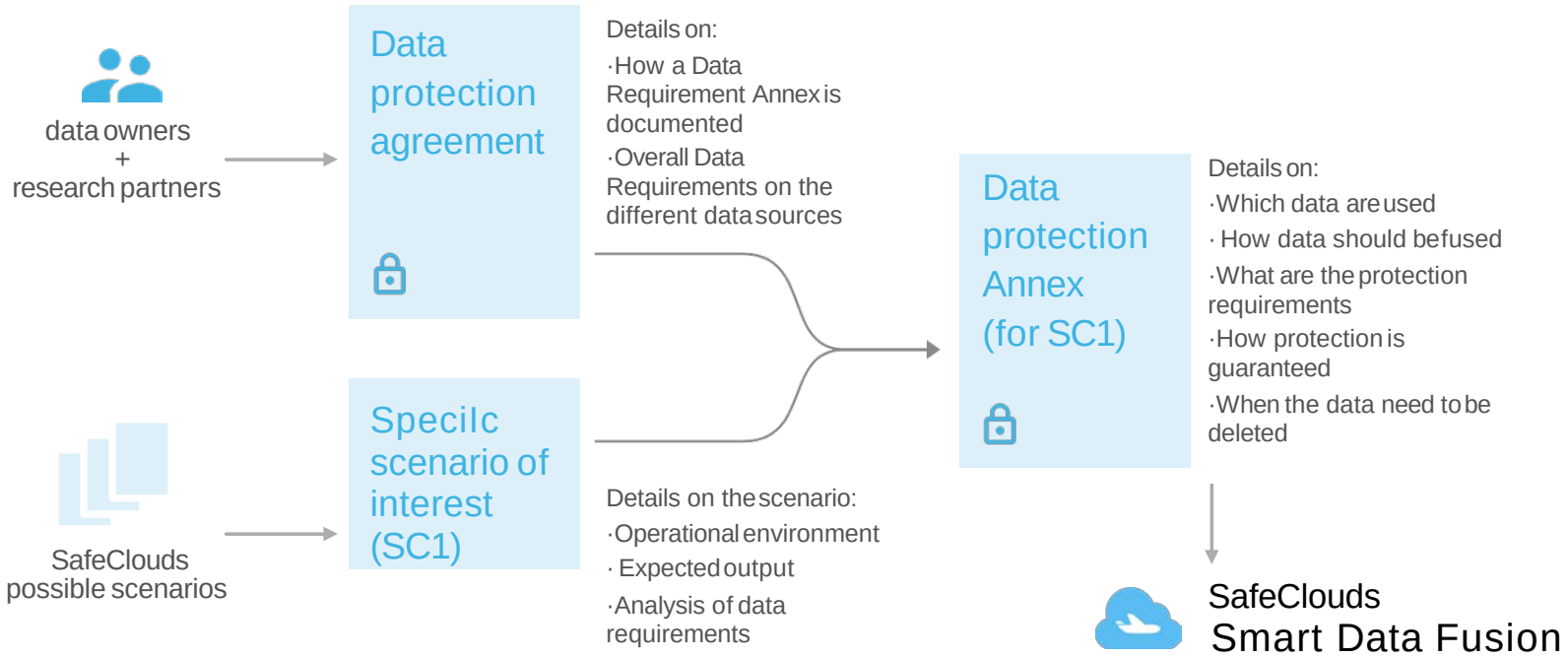
Scenario

Poor energy management resulting in unstable approaches

How to improve safety through data analytics?

- Complexity of causal factors: weather, tailwind, fatigue, pressure, workload, poor planning, pilot error, ATC interaction, procedures etc.
- Can we reach a well deHned data-driven understanding across airlines?
- Provide technology to ensure data protection while keeping data on all causal factors (training, fatigue)
- Fuse FDM data with meteo and radar data
- AO might not have a real-time use for data prediction; APP & TWR might
- AO's would appreciate technology for secure blind benchmarking

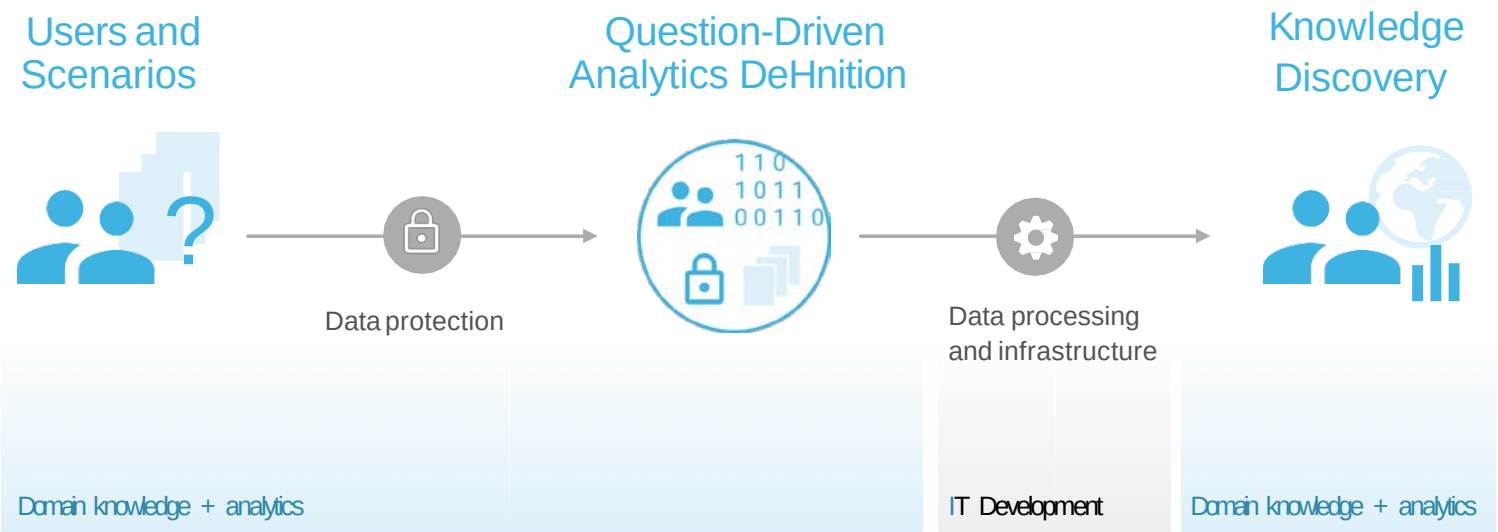
Data protection and scenarios



User-driven analytics

User + Questions	Outcomes	Methodologies, technologies
What happened? What's happening? Descriptive analysis	Well-deIned case studies, opportunities and challenges	· Clustering · Link prediction · Co-occurrence grouping · ProIling · Similarity matching
What will happen? Predictive analysis	Accurate projections of future states	·Parametric modelling · Methods to avoid overItting · Similarity networks and clusters ·Supervised / unsupervised segmentation
What should we do? Propositive analysis	Best-possible decisions	· Optimization · Simulation · Decision modelling · Causality modelling

Big data process



Your Big Data process is not what your Data Scientists and Software Engineers design, it is what ***you*** *implement for the benefit of your business / operations / company*

Thank you!

innovation for a complex world

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Questions?

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Closing Remarks

Jean-Marc Cluzeau
Head of Strategy and Programmes, EASA

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Thanks for attending the 2016 EASA Annual Safety Conference

Have a safe journey home!

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