IATA AVIATION DATA SYMPOSIUM

ATHENS, GREECE 25 – 27 JUNE 2019

DATA SCIENCE & TECHNOLOGY

IATA

Opening Remarks

Houman Goudarzi, Head of BI & Industry Engagement, IATA

Building a Data Science capability in an Aviation company

Eliano Marques, VP Enterprise Analytics , Data Science, Emirates Group

ENTERPRISE ANALYTICS

BRINGING DATA TO LIFE

Emirates | dnata

THE EMIRATES GROUP

IATA ADS 2019

Building a Data Science capability in aviation

Eliano Marques, VP Data Science, The Emirates Group

Agenda

ENTERPRISE ANALYTICS

1. Building a Data Science foundation to deliver
2. Building a Data Science foundation to win
3. Delivering value fast in production
4. Bringing it all together
5. An example use-case

The maturity levels (A^3) of Data Science across the Enterprise

ENTERPRISE ANALYTICS

R&D DS Team

Applied DS Team

A³utonomous

- All Business & Digital applications speak "Data Science"
- Execs and Business Leaders driving the agenda of "Data Science"
- Data Science Investment/ Revenue no longer have 10 zeros before a number

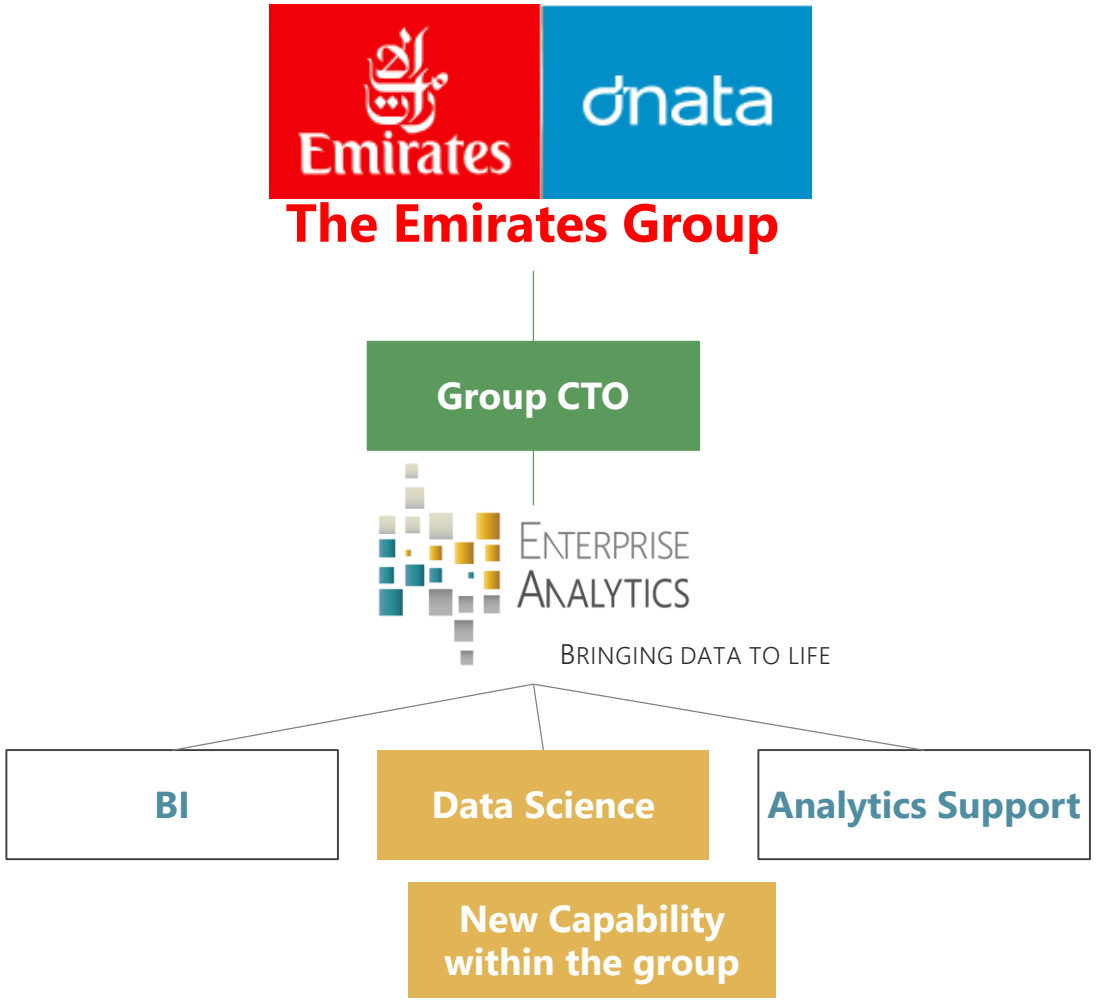
A²mbitious

- Focus on foundation
- Cares less about sexy words and more about production
- Very Business and Processes oriented

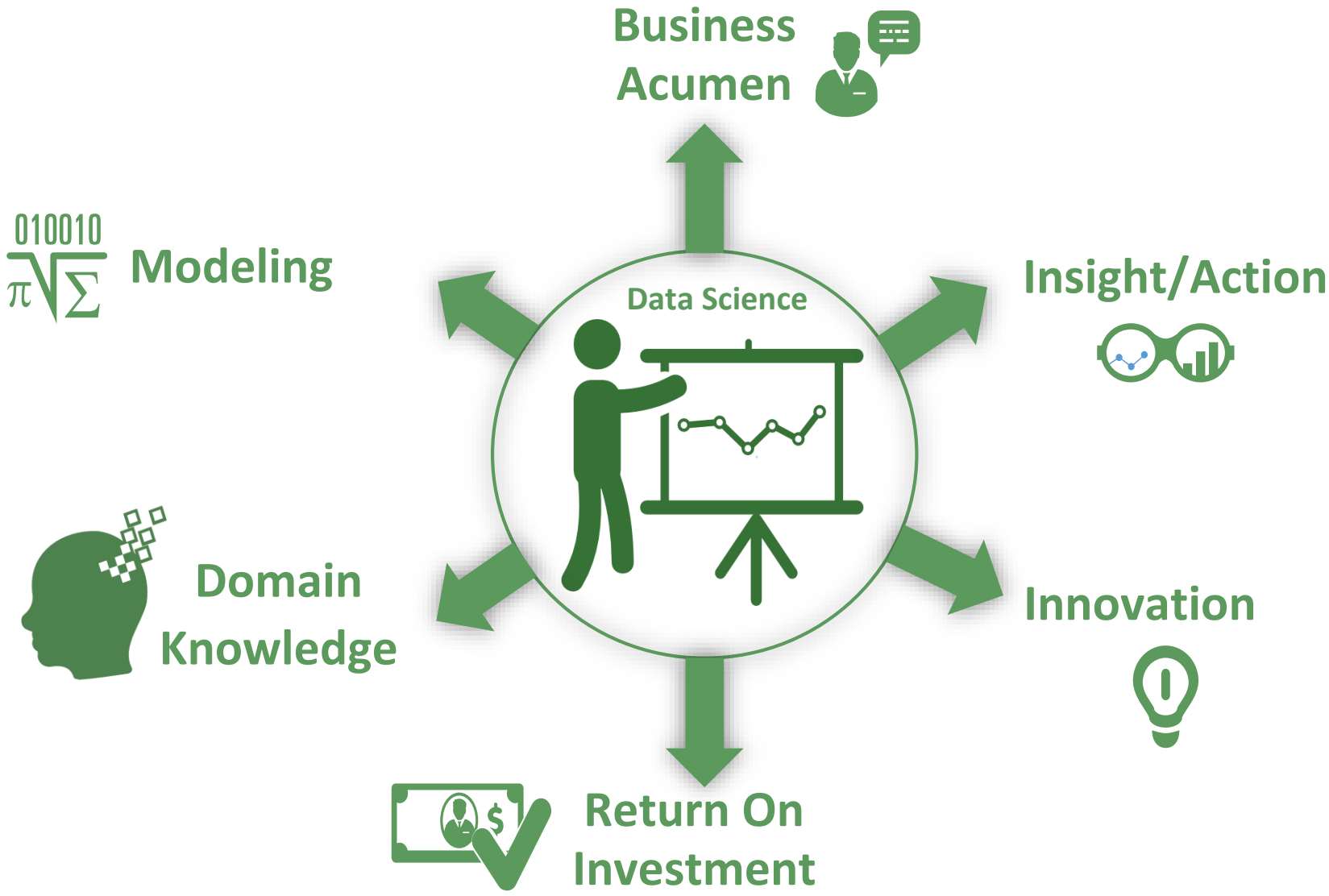
A¹spirational

- Hire 1 (or a few) Data Scientist and thinks problems are solved
- Does PoC (internal or external) and believes job is done
- Seems to be taken off but runs in circles, churn starts to appear

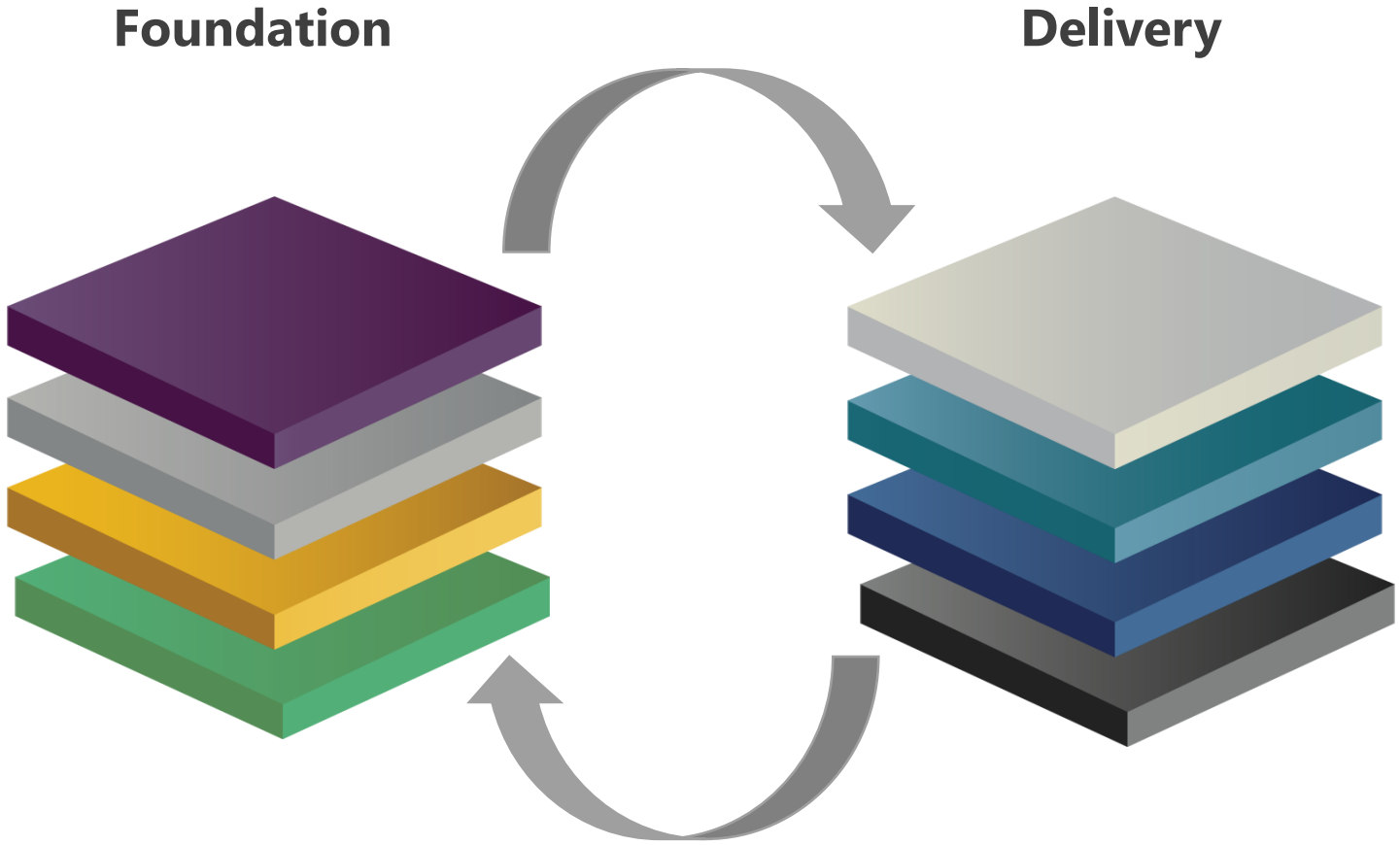
Background


The Emirates Group
Group CTO
ENTERPRISE ANALYTICS
BRINGING DATA TO LIFE
BI
Data Science
Analytics Support
New Capability within the group

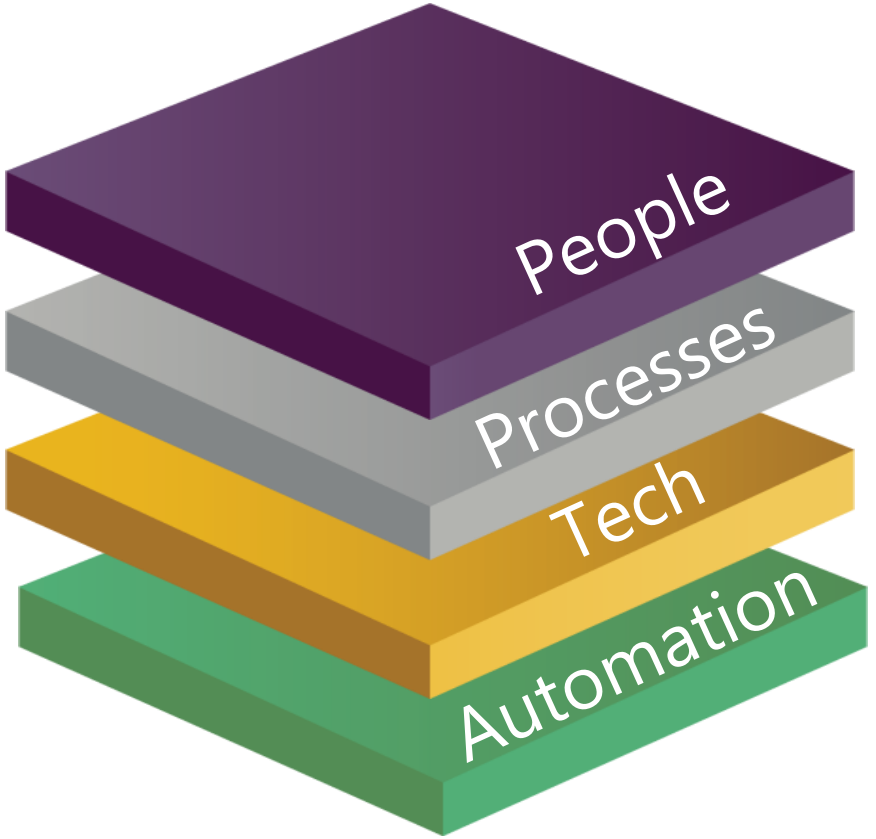
Building a Data Science foundation to deliver



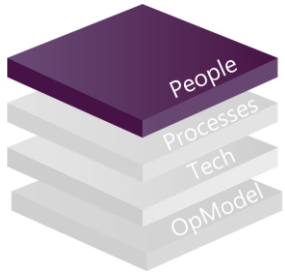
Building a Data Science foundation to deliver



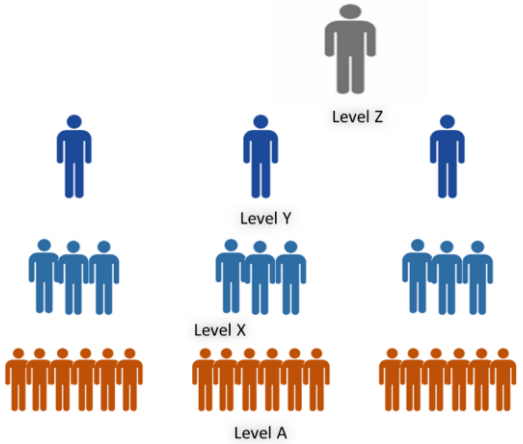
Building the foundation to win



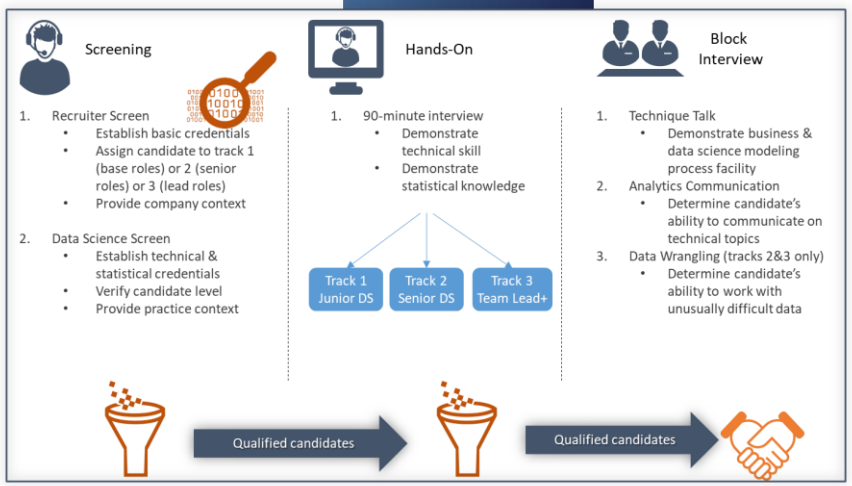
Building the foundation - People



Organise to grow and win



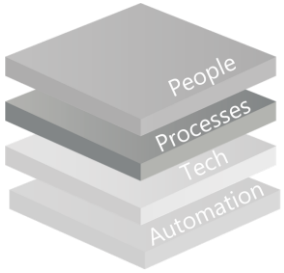
Recruit well & with standards



Invest in training paths

	Consulting Track	Data Science Technology Track	Data Science Track	Emirates Group Domains & Business Units
Level 1 - DS (Foundation)	DS110	DS120	DS130	DS140
Assessment 1	A-DS110	A-DS120	A-DS130	A-DS140
Level 2 - SDS (Intermediate)	DS210	DS220	DS230	DS240
Assessment 2	A-DS210	A-DS220	A-DS230	A-DS240
Level 3 – Team Lead (Advanced)	DS310	DS320	DS330	DS340
Assessment 3	A-DS310	A-DS320	A-DS330	A-DS340
Level 4 – VP+ (Expert)	DS410	DS420	DS430	DS440
Assessment 4	A-DS410	A-DS420	A-DS430	A-DS440

Building the foundation - Processes



Data Ingestion

End-to-end use-case delivery

End-to-end platform building

Career Paths/ Training curriculum

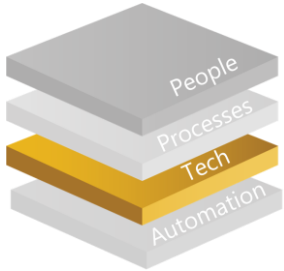
Recruitment

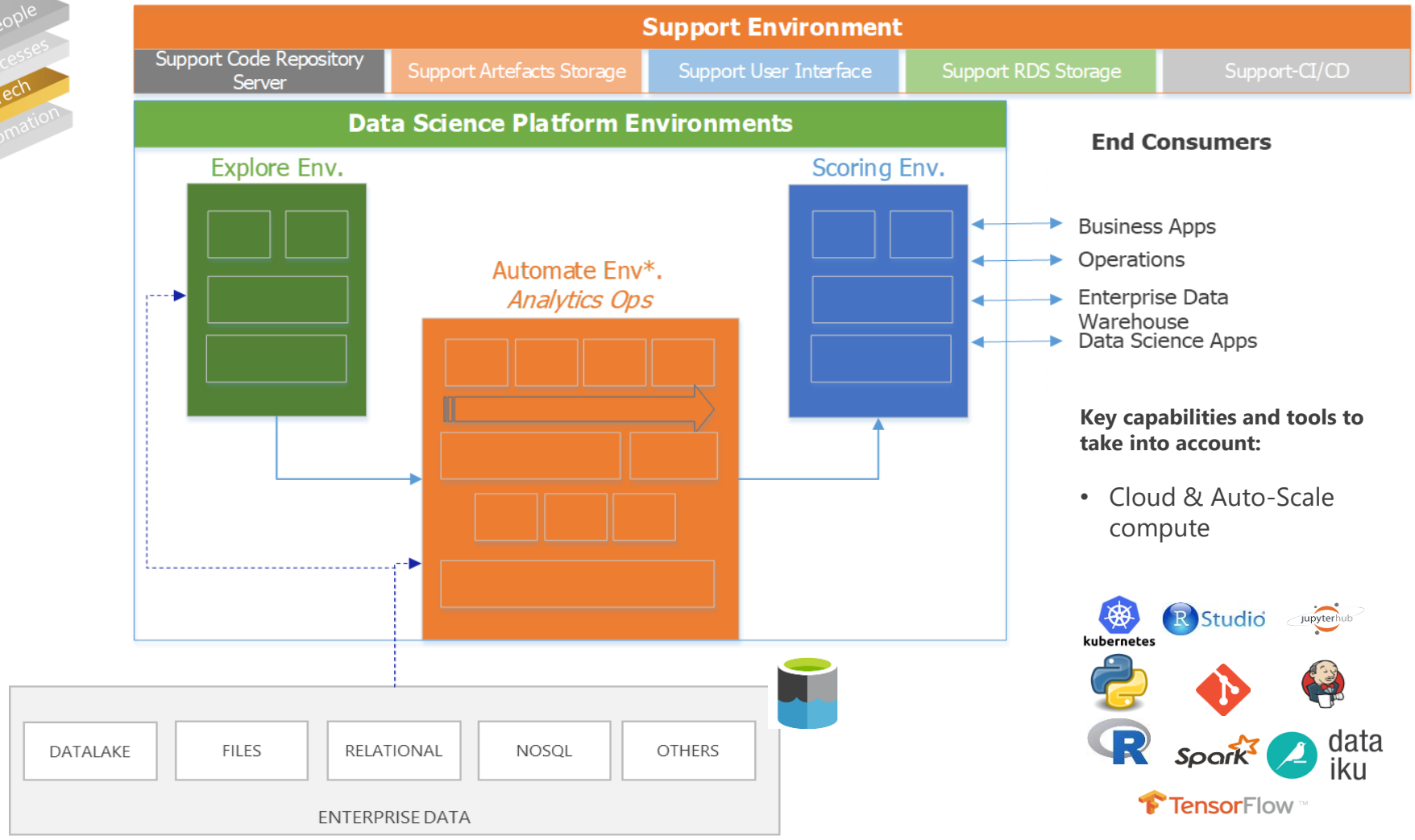
Model Lifecycle

Features Store

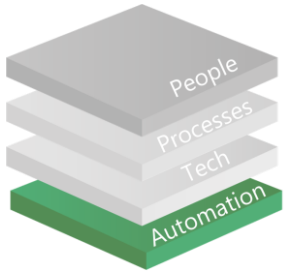
Common Libraries

Building the foundation - Tech

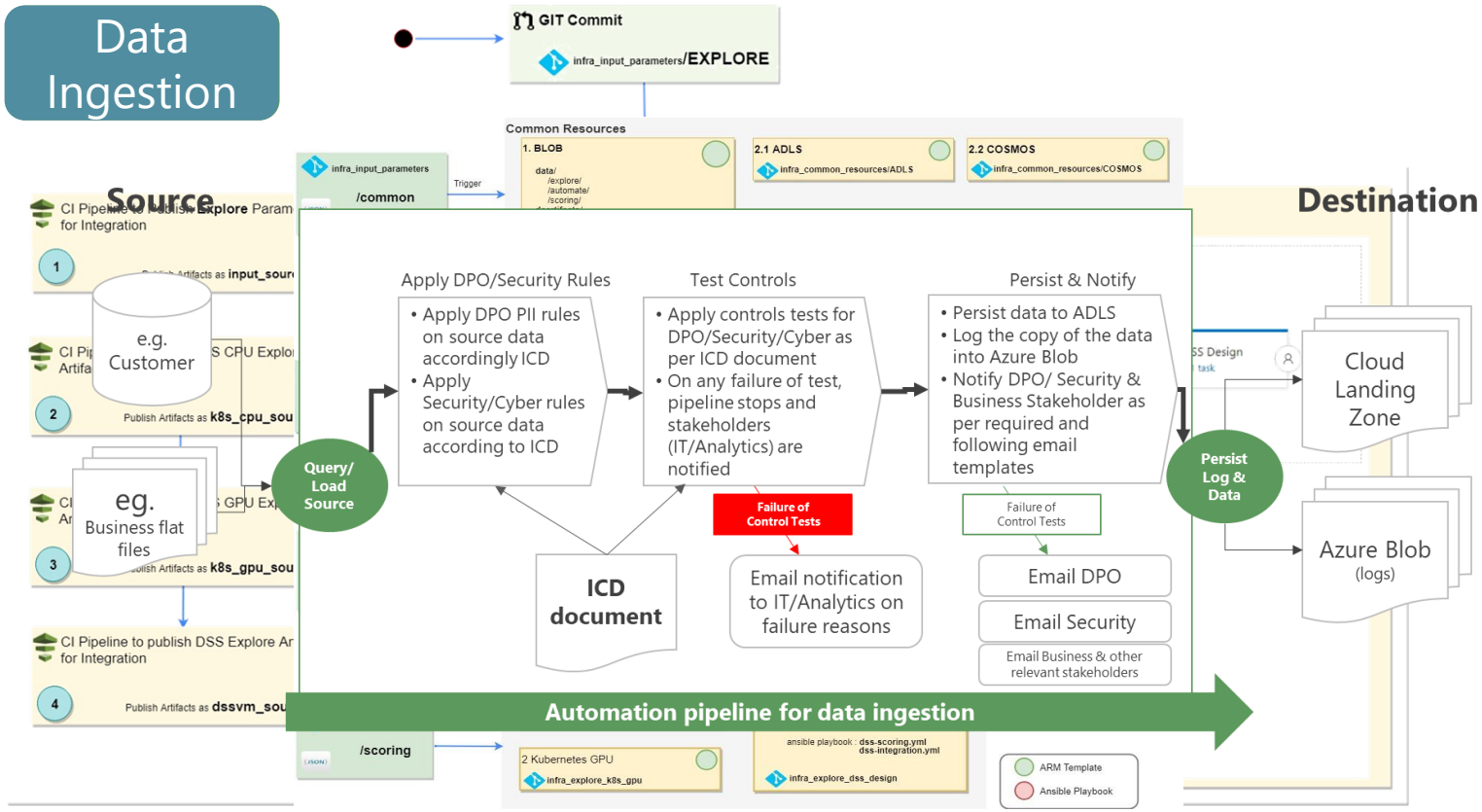




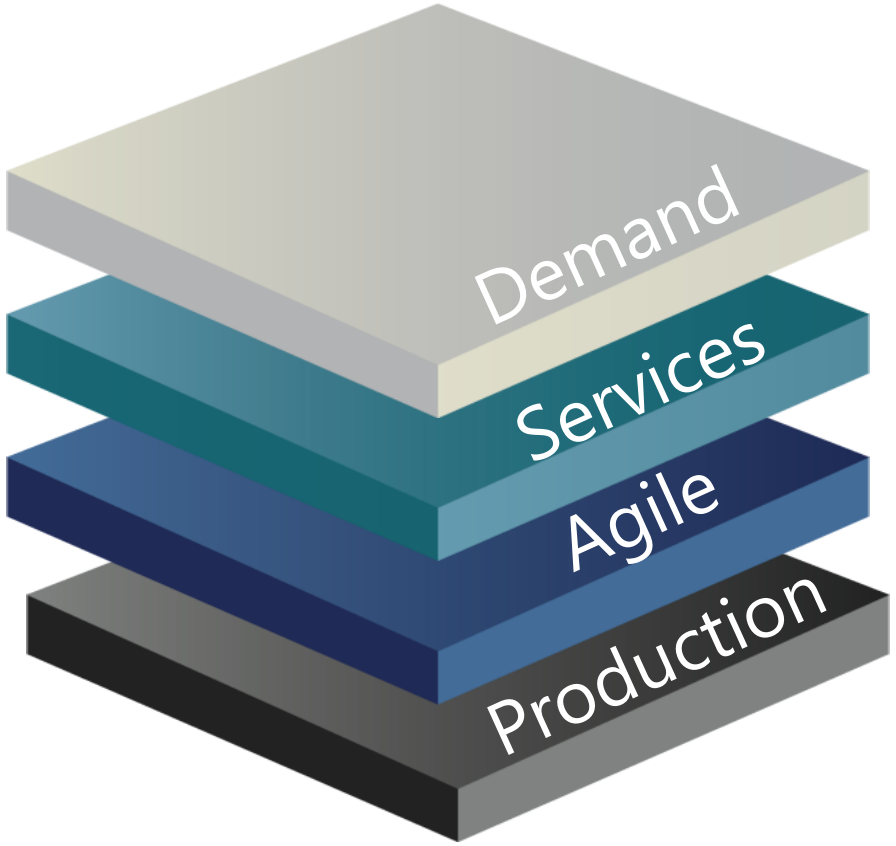
Building the foundation - Automation



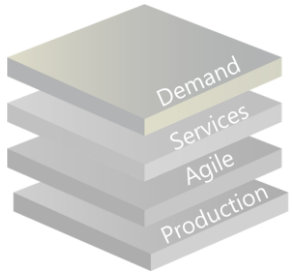
- Automation on top of well designed process reduces time to act from months to day
- Key focused areas to automate are Analytics Platform, Data Ingestion, Integration of outcomes



Delivering value fast in production



Delivering value fast in production - Demand



Aligned with each business unit

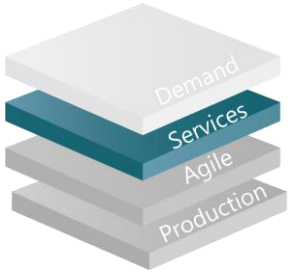
Portfolio Mgmt. + DS Team Leads

General Aviation Departments

Commercial	Operations	Marketing & Comms.
• Commercial Operations • Sales • Revenue Optimisation • Retail & Contact Centres • Loyalty Program	• Aircraft Services • Airport Services • Flight Operations • Engineering • Network Operations	HR Finance Fleet Planning

- Periodically collect and review demand
- Prioritise demand against a standard business & technical complexity matrix
- "Accepted" demand delivered through agile with clear timelines and path-to-production
- Each demand item requires buy-in and support from key stakeholders within business, primarily to drive change around adoption & integration

Delivering value fast in production - Services



Demand Management

Use-case exploration

Use-case Validation

Use-case Deployment

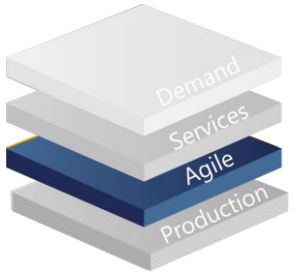
Use-case monitoring

Self-service use-case exploration

Self-service usage of DS outputs

Recruitment on behalf

Delivering value fast in production - Agile



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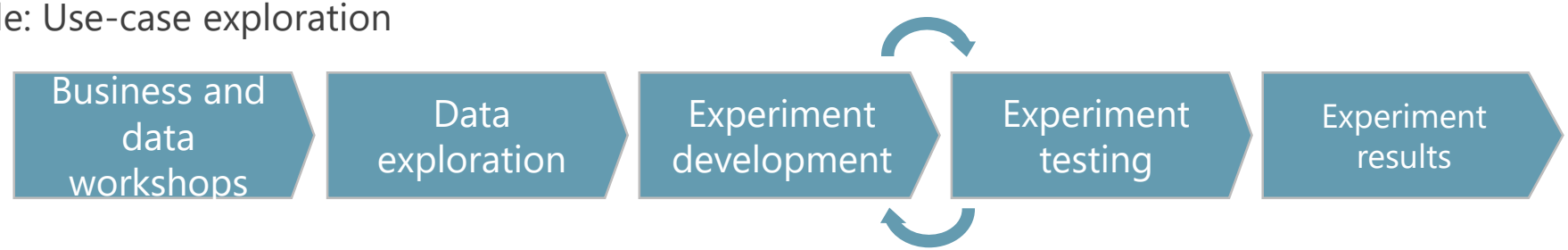
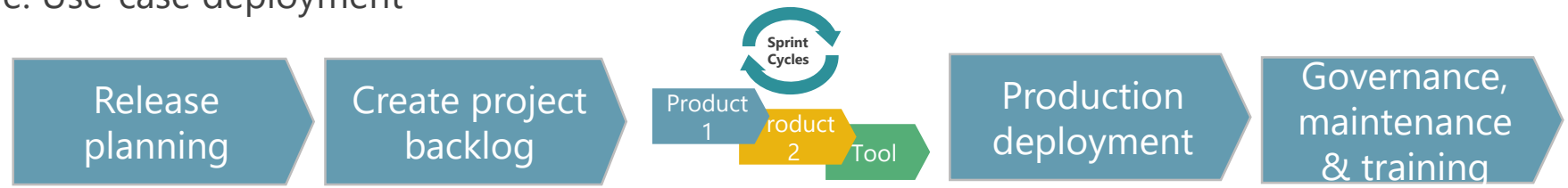
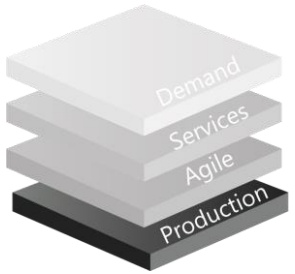
Example: Use-case exploration



Example: Use-case deployment



Delivering value fast in production - Production

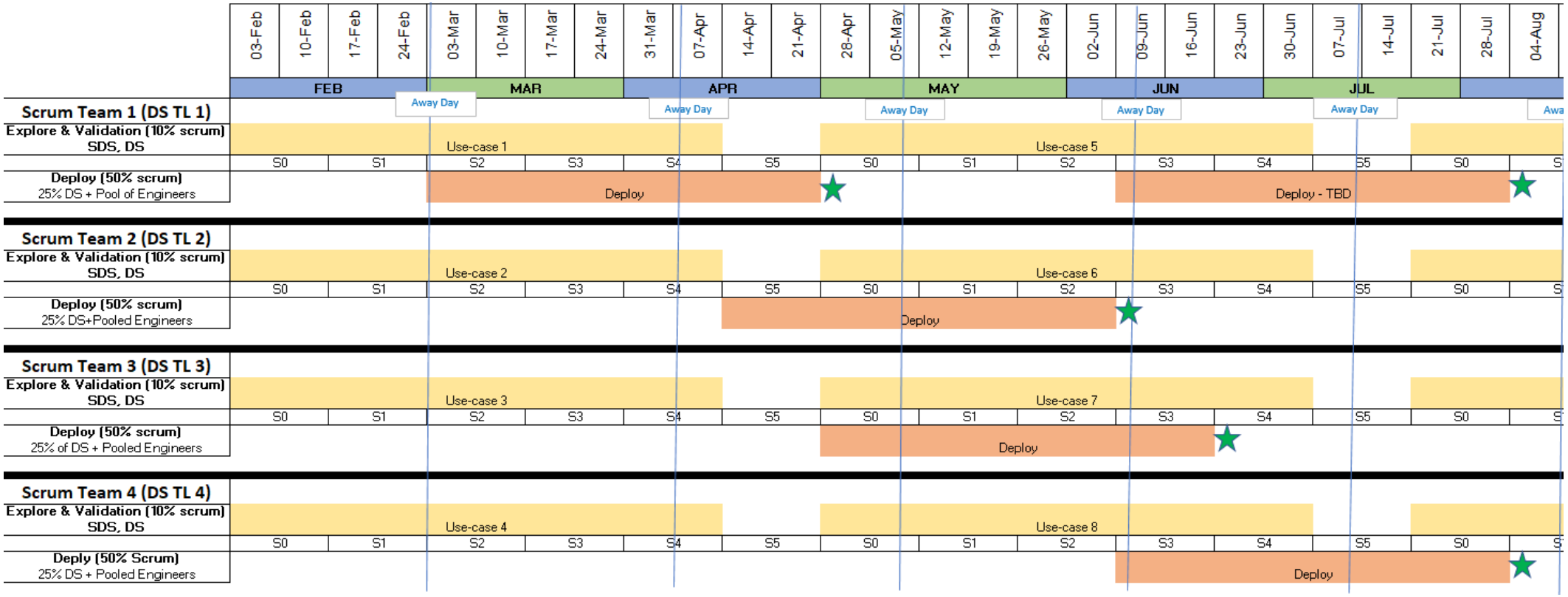


Define and build the to-be process that embeds the DS outcome	Build standard integration patterns to automate and accelerate rollouts	Automate deployment of the DS artefacts with clear business release input strategy	Build competition for production

Value to the Enterprise is one use-case are running in production

Bringing all together

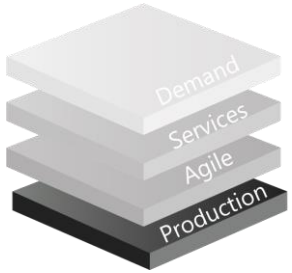
- Foundation + Delivery together enables definition of **Velocity**



Example backlog of use-cases:

- **Customer**
  - Next best action
  - Loyalty program
  - Customer experience
- **Operations**
  - Meals, Duty Free optimisation
  - Baggage handling optimisation
  - Repeat defect of assets parts
- **Shared services / Others**
  - Finance – Agents risk of default
  - HR – Employee Attrition

Deep dive into a use-case - Meals

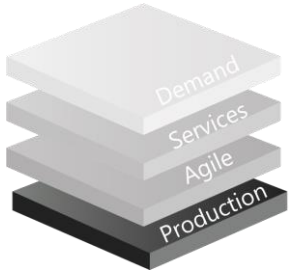


Business problem:

- To meet Pax meals first choice
- To reduce food wastage and as a result reduce cost
- To optimize supply chain via better estimation of uplift requirements

Challenges	Solution	Outcomes
• Data availability, quality & integration • Complexity of changing as-is process involving multiple stakeholders, e.g. catering, suppliers, operations, delivery, finance, … • On Demand Service	• Predict the demand of main course meal type by flight • Ability to provide short-term (t-4 hours) and long-term (t-72 hours) predictions • Self-adjusting to new menus and/or recent consumption	• Improved % of Pax meeting their meals first choice • Saved on fuel & supply chain • Automated/Simplified

Deep dive into a use-case - Meals



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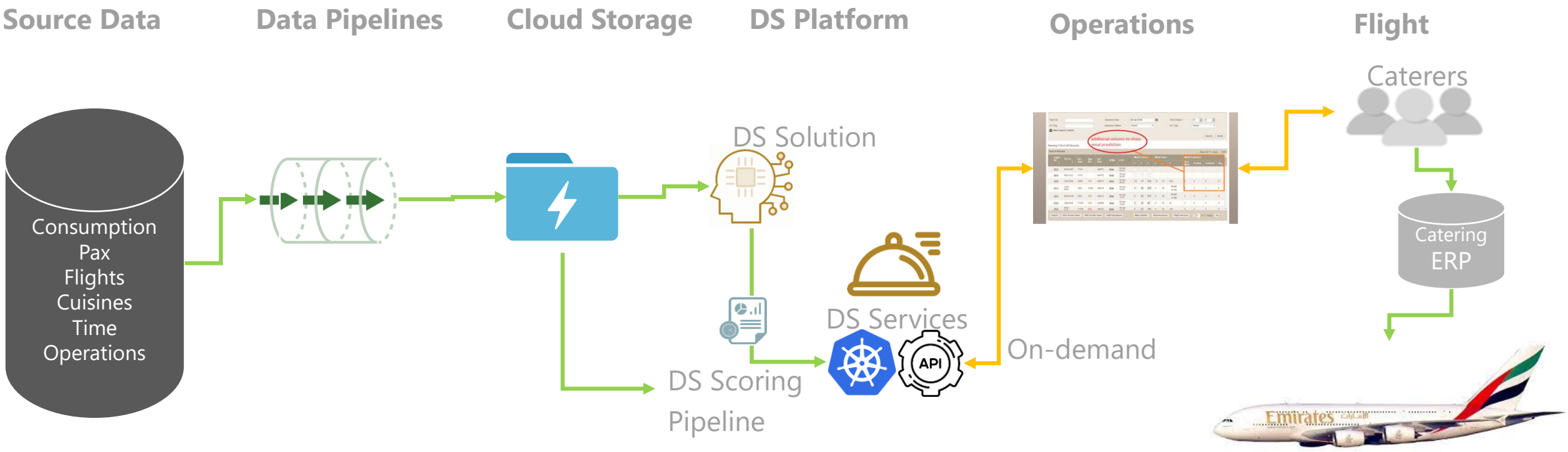

Bigger Data

Charles Girard, Customer Data Officer, Air France KLM

AIRFRANCEKLM
GROUP
BIGGER DATA
CHARLES GIRARD
CUSTOMER DATA OFFICER

116 COUNTRIES

101.4 MILLION
PASSENGERS

314 DESTINATIONS

33 MILLION FOLLOWERS
ON SOCIAL MEDIA

548 AIRCRAFT
OPERATED

AIRFRANCEKLM
GROUP

BIG DATA

AIRFRANCEKLM
GROUP

AIRFRANCEKLM
GROUP

Value Creation
AIRFRANCEKLM
GROUP

THE REALITY

AIRFRANCEKLM
GROUP

AIRFRANCEKLM
GROUP

GDPR / Privacy

AIRFRANCEKLM
GROUP

THE SOLUTION

AIRFRANCEKLM
GROUP

Data Management
AIRFRANCEKLM
GROUP

Pain but successful
AIRFRANCEKLM
GROUP

WHAT WE ACHIEVED

WITHIN AF & KL

AIRFRANCEKLM
GROUP

360° View
AIRFRANCEKLM
GROUP

Customer Journey

JOURNEY STAGE

- BOOKING
- PREPARATION
- AIRPORT
- FLIGHT
- ARRIVAL AIRPORT

CUSTOMER EXPERIENCE

- Web search
- Booking created
- Check in
- Boarding
  - Flight cancelled
  - Denied boarding
  - Downgraded
  - Upgraded
  - Missed connection
  - No show
  - Involuntary rebooking
- Flight departed
  - Flight departure delay
  - Customer case
- Flight arrived
  - Rate the fight
- Flight arrival delay
  - Bag irregularity
- Customer case
  - Complaint
  - Commercial gesture
  - Call center interaction

CUSTOMER CONTEXT

PNR3 CUSTOMER CONTEXT

PNR2 CUSTOMER CONTEXT

PNR1 CUSTOMER CONTEXT
Business/leisure motive
Corporate flag
Specificities
Free & paid services...

CUSTOMER PROFILING
Corpo indicators
Cabin indicators
Travel configuration (Single/dual/family/group)
Top O&D

CUSTOMER RECOMMENDATIONS

AIRFRANCE KLM GROUP

IS IT ENOUGH ?

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GROUP

Interline : 10 / 12%
Source IATA
AIRFRANCEKLM
GROUP

Standard : IATA ID

AIRFRANCEKLM
GROUP

LET'S DREAM

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BENEFITS

Seamless journey

Frequent flyer proof

Hassle free preparation

Better insights

Investment rationalization

Improved personalisation relevancy

Leveraging value creation

AIRFRANCEKLM GROUP

AIRFRANCE KLM GROUP

LET'S SHAPE THE NEW REALITY

How a leading airport has built a wide spectrum of data (AI/data science/BI) capabilities

Sjoerd Blüm, CIO, Amsterdam Airport Schiphol

The Dawn of Urban Aerial Ridesharing

Ian Andreas Villa, Vehicle Partner & Strategic Modeling Lead, Uber

Networking Break

GROUPE AZUR

IATA AVIATION DATA SYMPOSIUM

ATHENS, GREECE 25 – 27 JUNE 2019

DATA SCIENCE & TECHNOLOGY

IATA

Introduction

Marie Masserey, Head, Industry Architecture, IATA

How can airlines derive value from data

Moderator: **Marie Masserey**, Head, Industry Architecture, IATA

Soumit Nandi , MD, Customer Technology Platforms, United Airlines

Dave Weghorst, Business Consultant, Delta Air Lines

Andrew Webster, Digital Business Transformation Manager - Shop Order Pay, IAG

Opening Remarks

Soumit Nandi, MD, Customer Technology Platforms, United Airlines

Key drivers

- Customer centricity
- Retail transformation
- Operational transparency
- Privacy, trust and data ownership
- Technological evolution

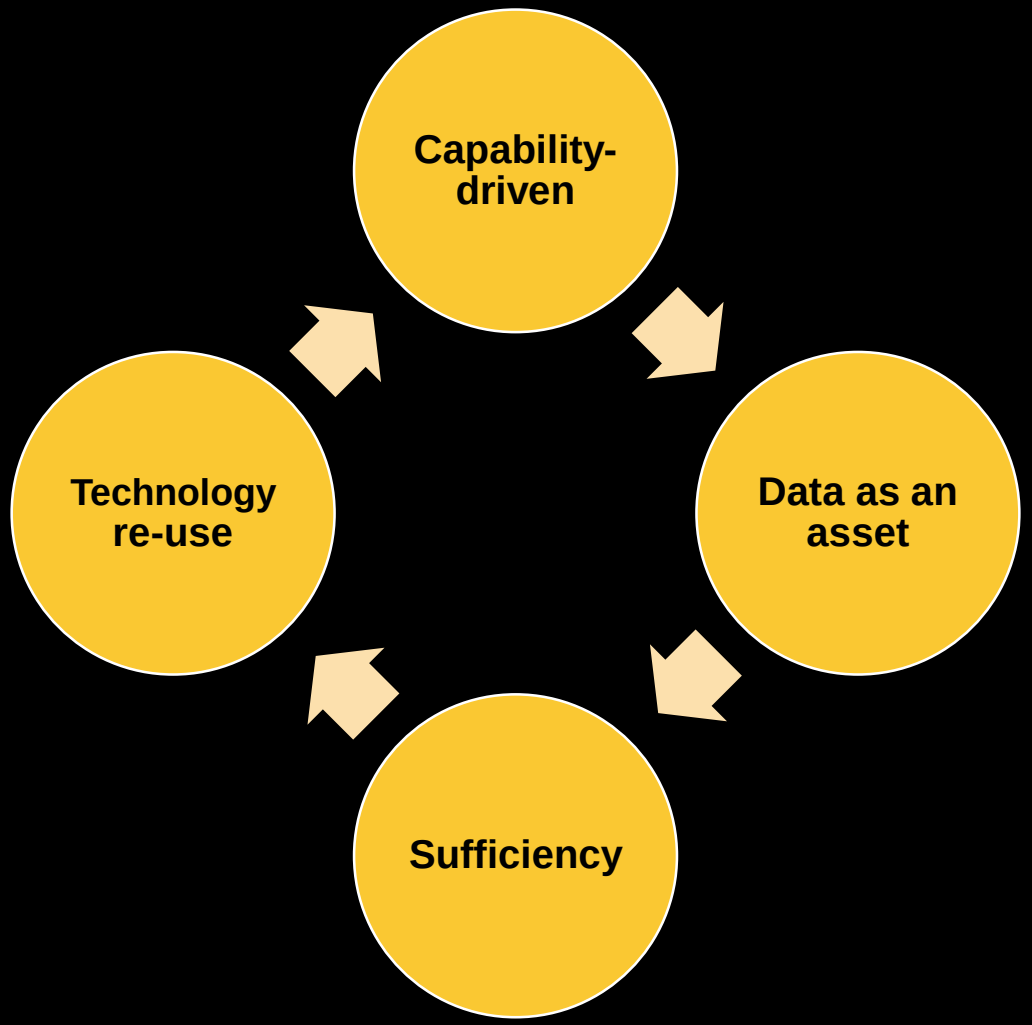
Business Architecture

- Intelligent customer channels
- Retail business architecture
  - Customer
  - Storefront
  - Partnership framework
- Transparency end-to-end
  - Operational data exchange
  - Customer transparency
  - Journey management
- Airport as a key logistical hub
- Aircraft operation

Enabling capabilities

- Shared semantics
- Events as triggers for automation
- Identification and identity management
- Location, addressing and discovery
- Distributed data processing

Guiding Principles



- Address industry-wide needs
- Embody diverse perspectives
- Leverage proprietary knowledge
- Consider various legal or regulatory requirements
- Aim for simplicity
- Serve as building blocks for innovations
- Drive interoperability and scalability
- Enable streamlining of development and implementation
- Enable cost reduction and control
- Enable new opportunities

How can airlines derive value from data

Moderator: **Marie Masserey**, Head, Industry Architecture, IATA

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Uncovering value from data

Soumit Nandi
Managing Director – Customer Technology Platforms

@soumit

A STAR ALLIANCE MEMBER

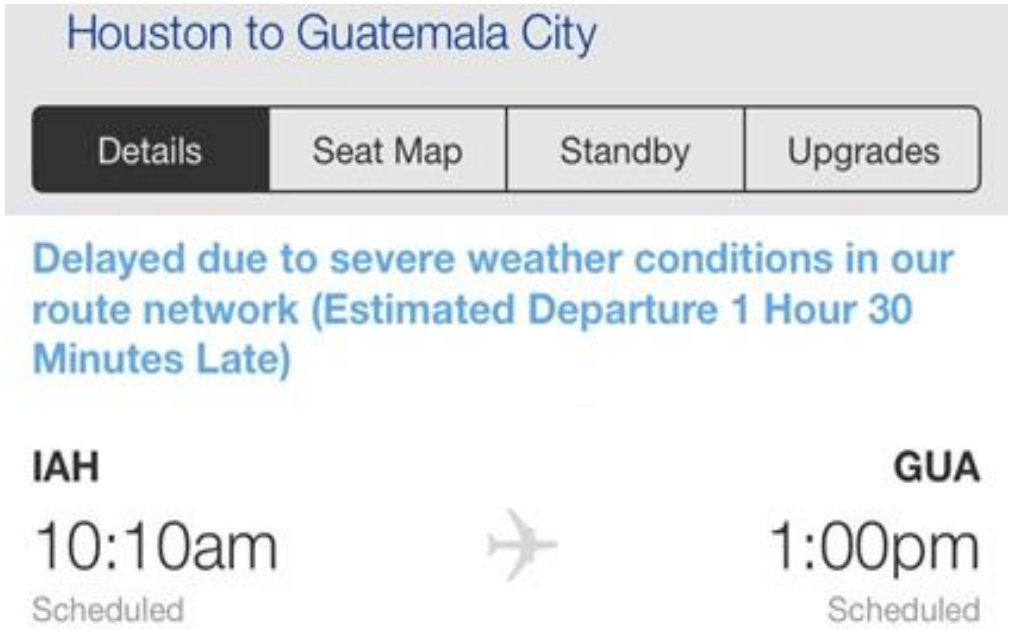
UNITED

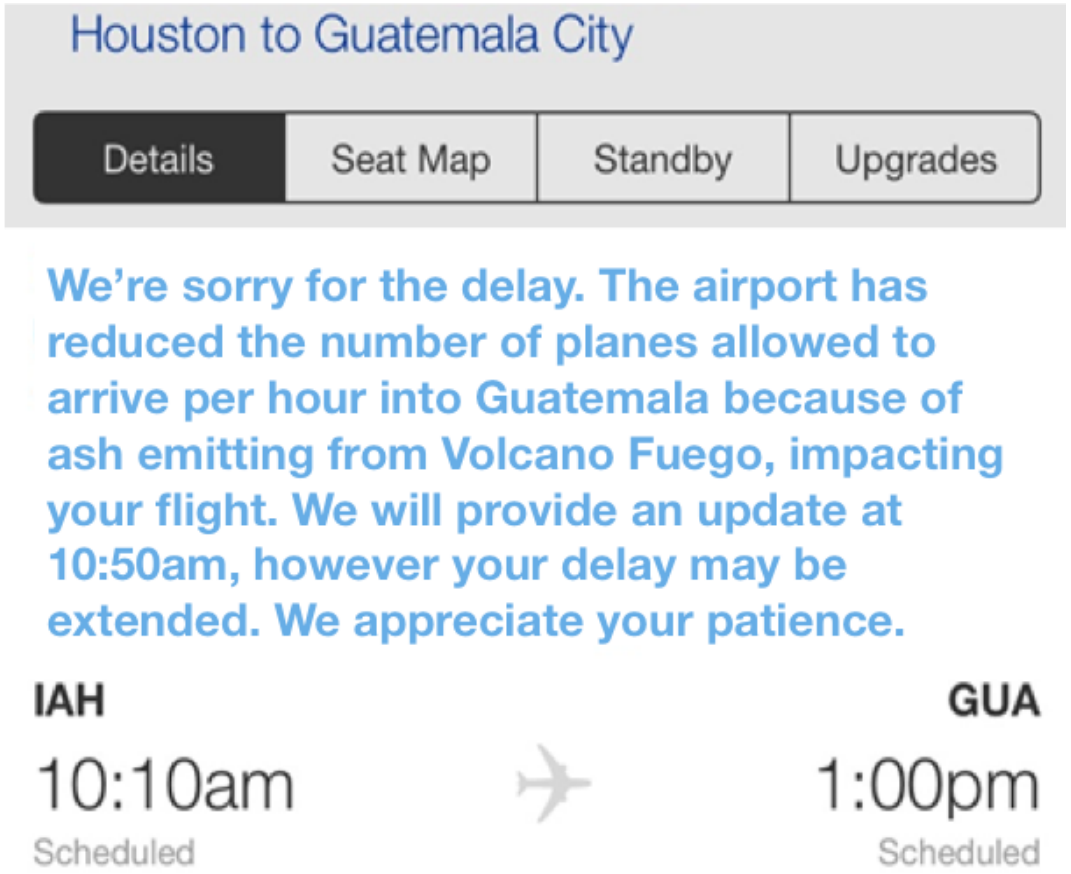
Make smarter decisions
Tackle tougher problems
Tell better stories
UNITED

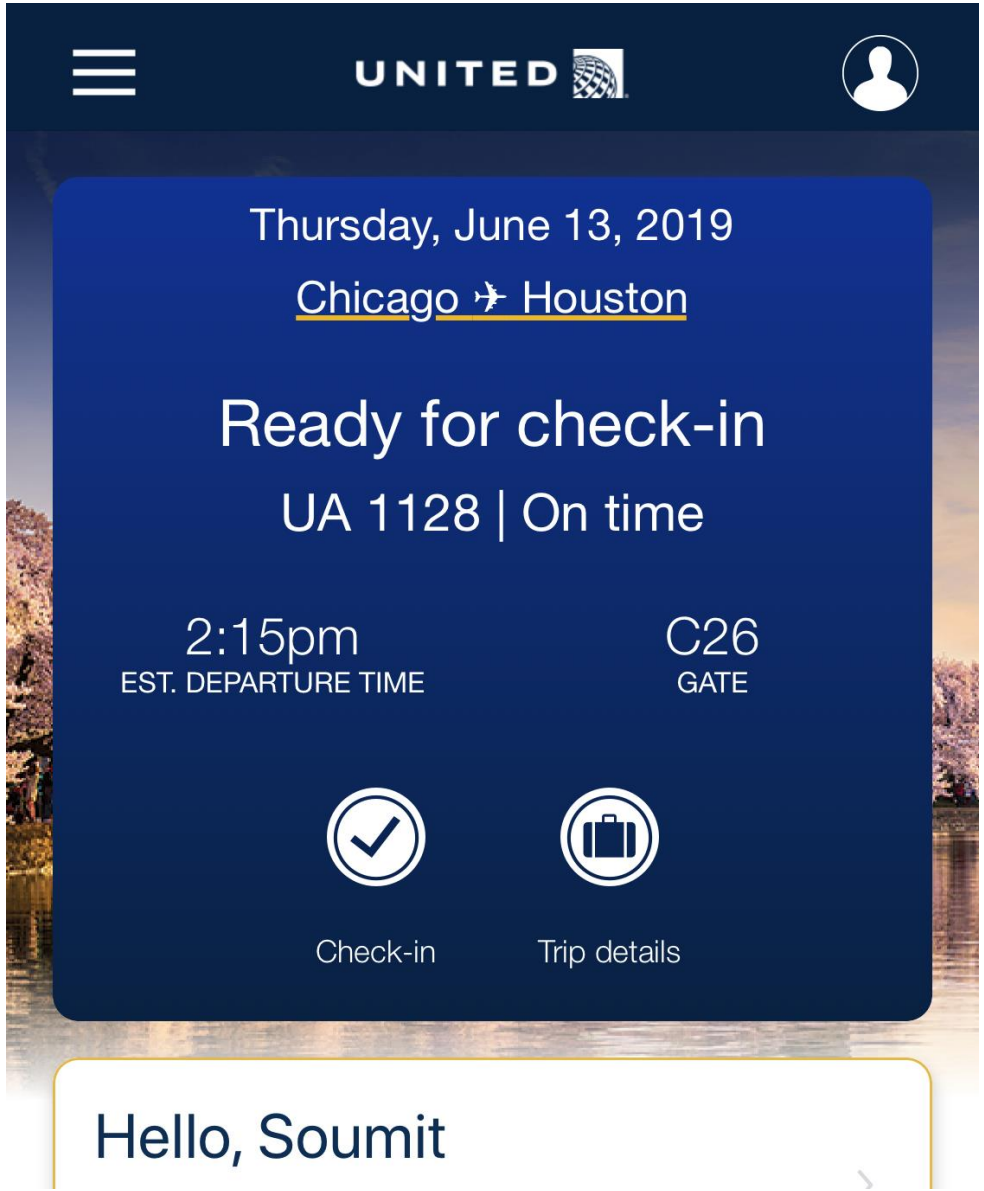
When do we swap a flight?

How can we improve connections?

How do we keep customers informed?


Houston to Guatemala City
Details
Seat Map
Standby
Upgrades
Delayed due to severe weather conditions in our route network (Estimated Departure 1 Hour 30 Minutes Late)
IAH
10:10am
Scheduled
GUA
1:00pm
Scheduled


Houston to Guatemala City
Details
Seat Map
Standby
Upgrades
We're sorry for the delay. The airport has reduced the number of planes allowed to arrive per hour into Guatemala because of ash emitting from Volcano Fuego, impacting your flight. We will provide an update at 10:50am, however your delay may be extended. We appreciate your patience.
IAH
10:10am
Scheduled
GUA
1:00pm
Scheduled



Leveraging data is critical to customer centricity

The Data Revolution
- Deriving Value from Data

IATA Aviation Data Symposium

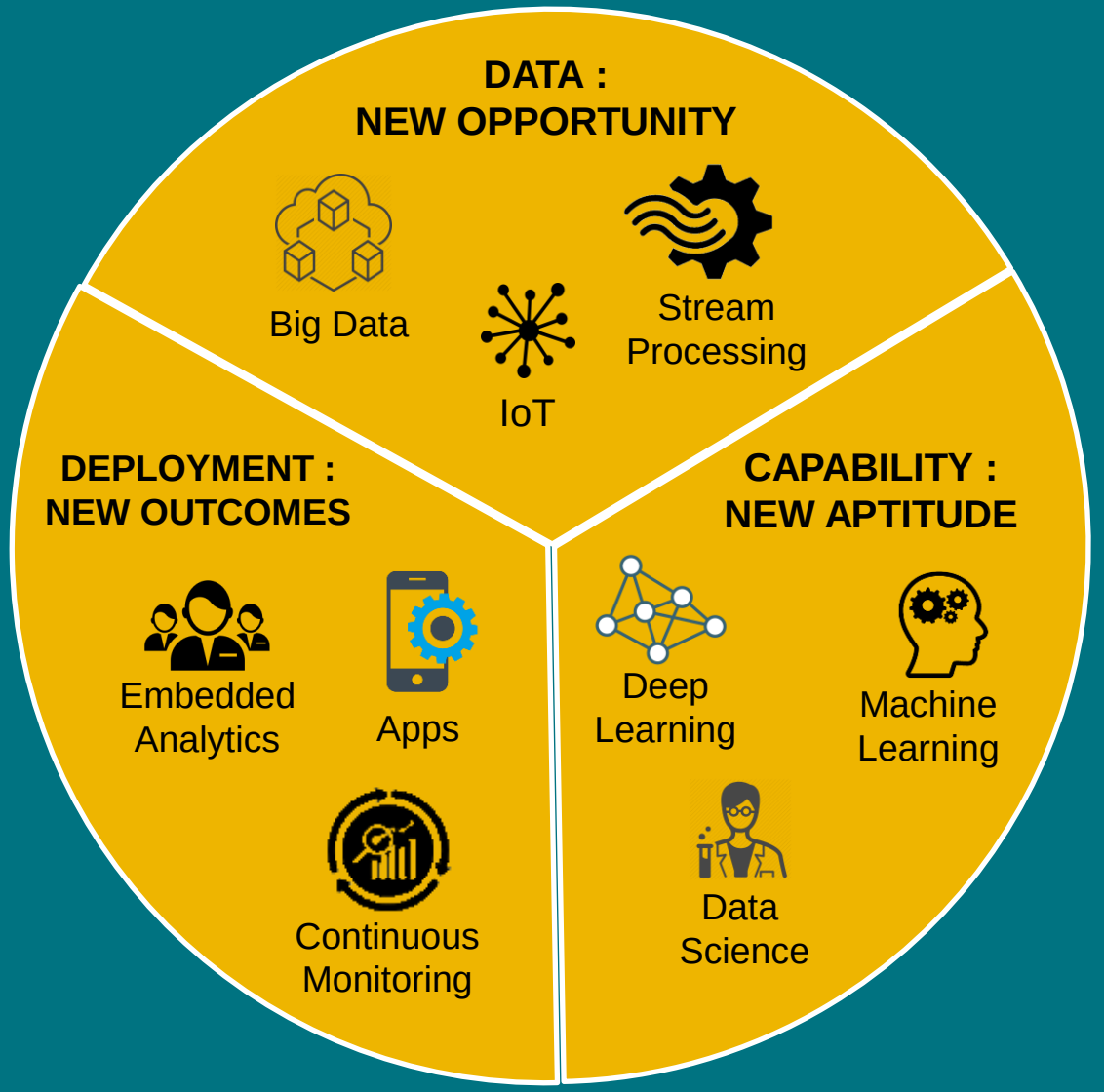
26th June 2019

IAG INTERNATIONAL AIRLINES GROUP

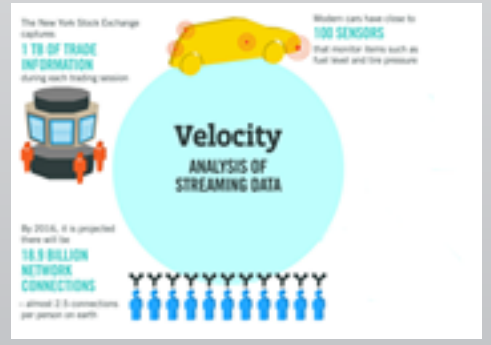
The Data Revolution

There has been a step change in :

- Ability to handle and store lots more data
- The accessibility of analytical techniques
- The focus of how we use and create value from our data – ***Embedded Analytics***



Big Data : Finally data takes centre stage!



- Data is vital! Everything else starts with the data!
- We must collect and protect our data
- Use new data sources, create data sources

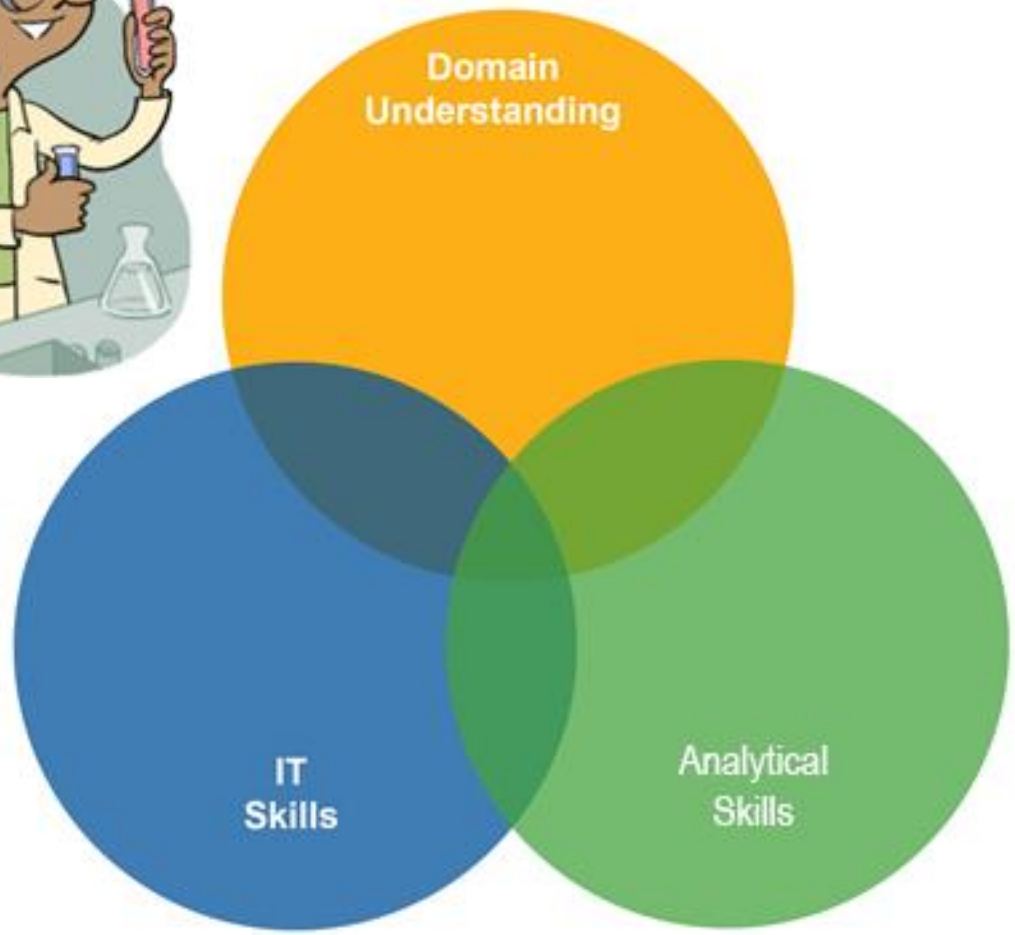
hadoop

APACHE Spark™

amazon web services™

- Flexibility, connectivity at a low cost
- Speed to market – approach turned on its head

Data skills are essential…



- This is becoming far more accessible, tools are amazing … but it is not easy!
- **Skills are vital and in short supply.**

- Big data not as friendly as the Data Warehouse!
- Integration lies with the analyst - Data skills key

- Data is vital – creating interesting data features
- Domain understanding is key in the data phase

- However ... the stats/models are far more accessible to most, in some areas (e.g. Deep Learning) domain expertise less important.

We need to put our data to work –

Owning and managing its use from end-to-end

Collect

- Collect all types of data structured and unstructured
- Include all open sources of data
- Leverage a single platform with a common application layer
- Write once and deploy anywhere

Connect

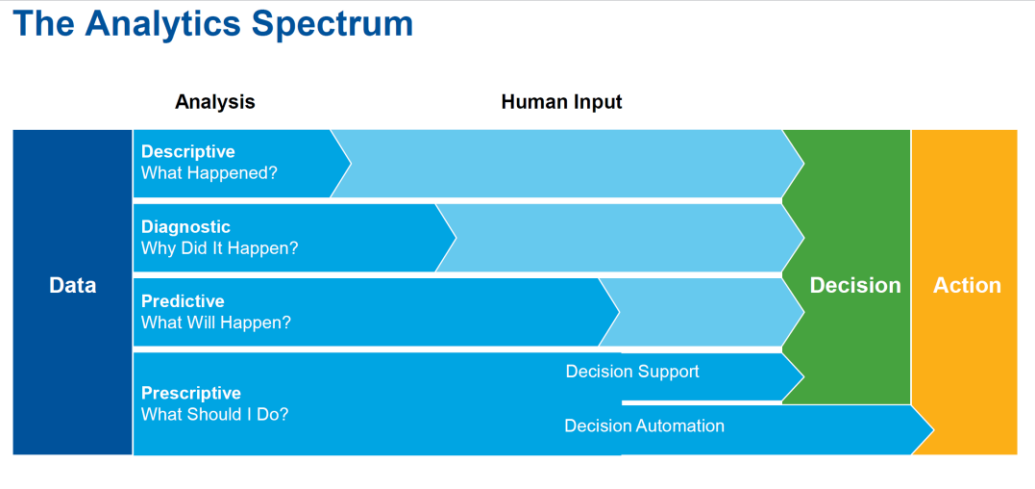
- Locating, cataloguing and masking data
- Integrate fluid data sets
- Deliver built-in compliance and privacy by design
- Leverage advanced machine learning capabilities
- Creating speed and agility

Create

- Deliver descriptive, prescriptive and predictive insights across all types of data
- Empower all your teams and their unique use cases
- Enable advanced analytics and data science methods

From Dashboards to “Embedded Analytics”

As ever the most important part is getting Business Value from all this!



Change in Focus

Move expectation from reporting and us doing the decision making

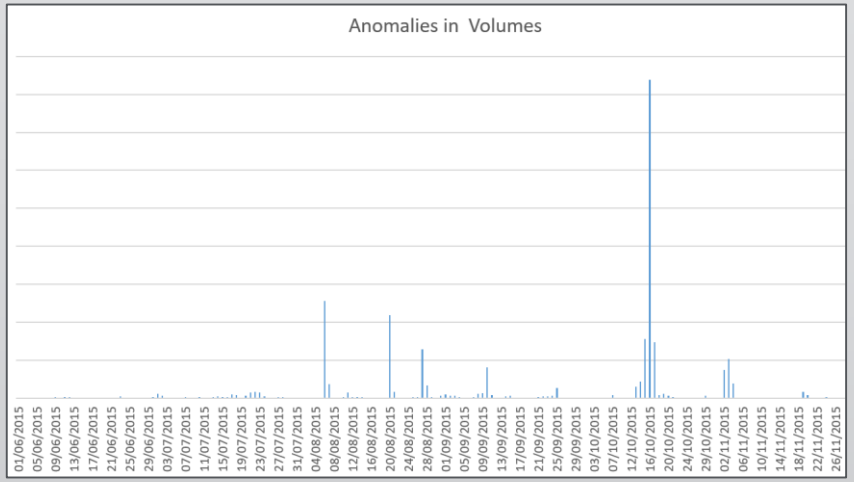
Continuous monitoring embedded within business processes

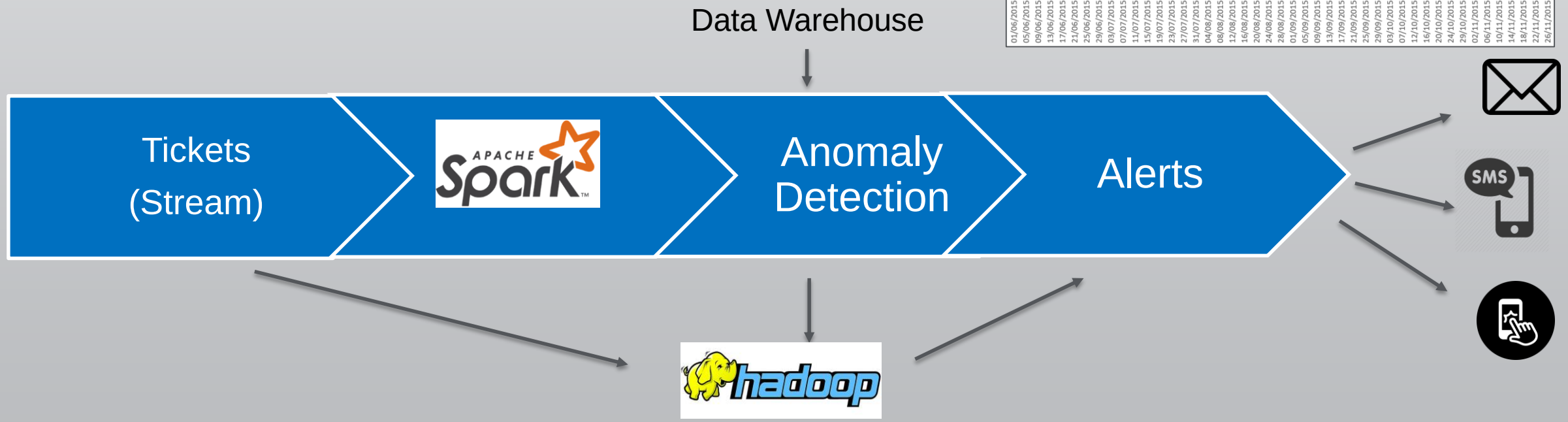
Automated decisions where possible

- Increase value by embedding analytics within our Business Processes
- Challenge for the business : Focus on the real questions and desired outcomes not data
- Challenge for the analysts : Not only reframing the business problem but deliver products

Fares Monitor

Question : Can we quickly identify fares that may be incorrect?
Desired Outcome : Fares are corrected as quickly as possible
Benefit : Fares in the market are as we planned



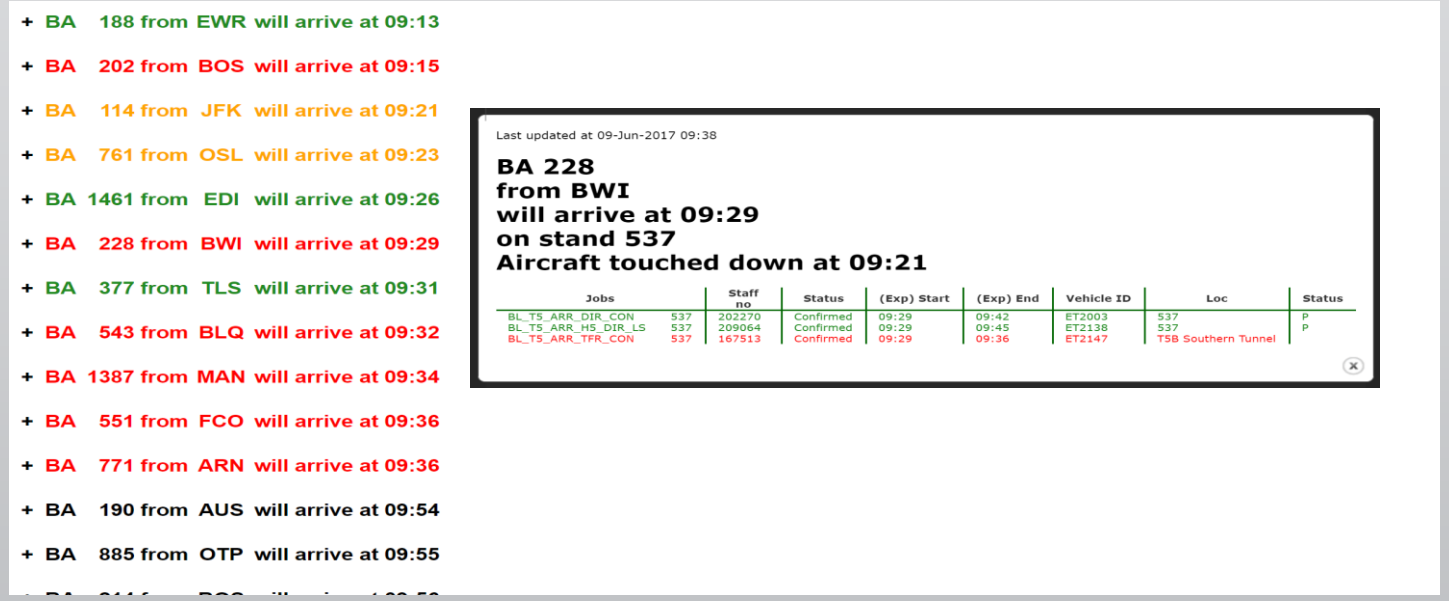


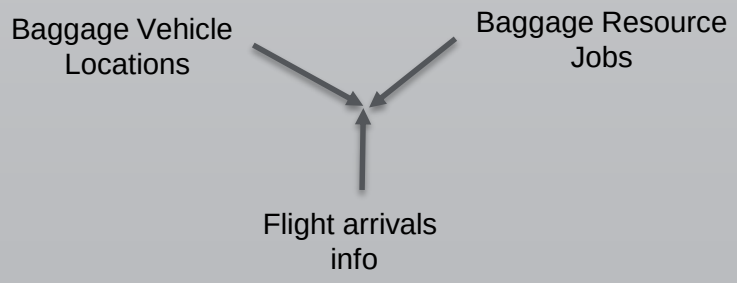
Simple, focused, beneficial, big data, right time, embedded

What has been done? Baggage

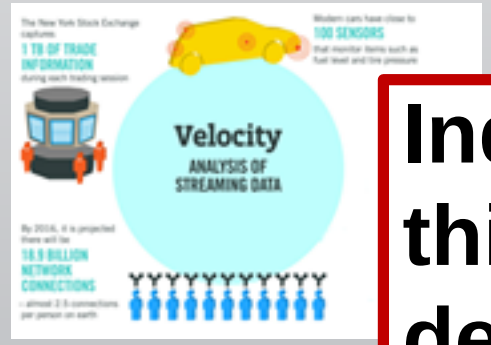
Real/Near Real time data being combined to enhance Business Processes

Can we give early warning to Baggage Hall of arriving flights with delays in removing bags?





Big Data : To recap…



- Data is vital! Everything else starts with the data!
- We must collect and protect our data

Industry Standards help us achieve this along with common data definitions from the AIDM

- Flexibility, connectivity at a low cost
- Speed to market – approach turned on its head

How can airlines derive value from data

Moderator: **Marie Masserey**, Head, Industry Architecture, IATA

Soumit Nandi , MD, Customer Technology Platforms, United Airlines

Dave Weghorst, Business Consultant, Delta Air Lines

Andrew Webster, Digital Business Transformation Manager - Shop Order Pay, IAG

ATSB and Passenger Standards Governance

Single combined Passenger Services and Tariffs Conference

Steering Group

Plan Board

Scheduling (SSIM)
Coding
MCT
Interline

Shop-Order Board

Ticketing
Reservations
Offer and Order Management
(NDC, ONE Order)
Tariffs and Currency
Intermodal

Travel Board

Baggage
Passenger Experience
BCBP
Airport Handling
Common Use
Facilitation

Pay-Account Board

Reporting (DISH)
Fraud
Payment

Architecture & Technology Strategy Board

Data Exchange
Interoperability
AIDM
Architecture
Data Security

IATA

Networking Lunch

IATA AVIATION DATA SYMPOSIUM

ATHENS, GREECE 25 – 27 JUNE 2019

DATA SCIENCE & TECHNOLOGY

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