IATA AirPharma Conference

29 – 31 October 2019, Amsterdam, Netherlands

IATA AirPharma Conference

29 – 31 October 2019, Amsterdam, Netherlands

Opening Day 2

Andrea Gruber
Head of Special Cargo
IATA

IATA AIRPHARMA CONFERENCE

Amsterdam, Netherlands
29-31 October 2019

#IATA_Cargo

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IATA Competition Law Compliance

Do not discuss:

- Pricing, including fares, service charges, commissions, etc.
- Bids on contracts or allocation of customers
- Geographic/Product market allocations and marketing plans, including
  - Expanding or withdrawing from markets
  - Group boycotts
  - Your commercial relations with agents, airlines or other third parties

Any discussion aimed at influencing the independent business decisions of your competitors

You will be asked to leave the meeting, and the meeting may be terminated, if the above-mentioned discussions occur.

Remember: All discussions count, even informal ones outside the meeting room!

Thank you to all our sponsors!

Welcome Back Day 2
Chairman Opening Remarks

Maarten van As
Managing Director
Air Cargo Netherlands (ACN)

Keynote Speech

Simone Kukenheim
Deputy Mayor
City of Amsterdam

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29-31 October 2019

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Industry Outlook
from the Airline Perspective

Enrica Calonghi
Director Verticals, Global Head Pharmaceutical Logistics
Air France KLM Cargo

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The Airline Perspective

IATA Airpharma Conference

30 October 2019

Market development

The market will more and more be divided into

Generic pharma

Requiring low maintenance transportation or sea freight

Gene editing technologies

Requiring advanced cool chain solutions

Healthcare verticals

at Air France KLM Martinair Cargo

Our focus is to create value for our **Customers**

Transparency

Challenges

Create an **ecosystem** where we can all cooperate

Create **value** for all parties in the chain

Initiatives

of Air France KLM Martinair Cargo

IATA CEIV Certification

Air France KLM Martinair Cargo is the **first major group** to be IATA – CEIV re-certified

Is the effort valued by **our customers?**

Six months study

on value of the certification

Conclusions

Recognition
Engagement
Enhancement
Efficiency

Pharmaceutical logistics

Ultimately, the patient is our final Pharma Client

IATA CEIV Pharma
Leverage effect and benefits

Juerg Meier
Senior Vice President QSHE Security & DG HazMat
Kuehne & Nagel

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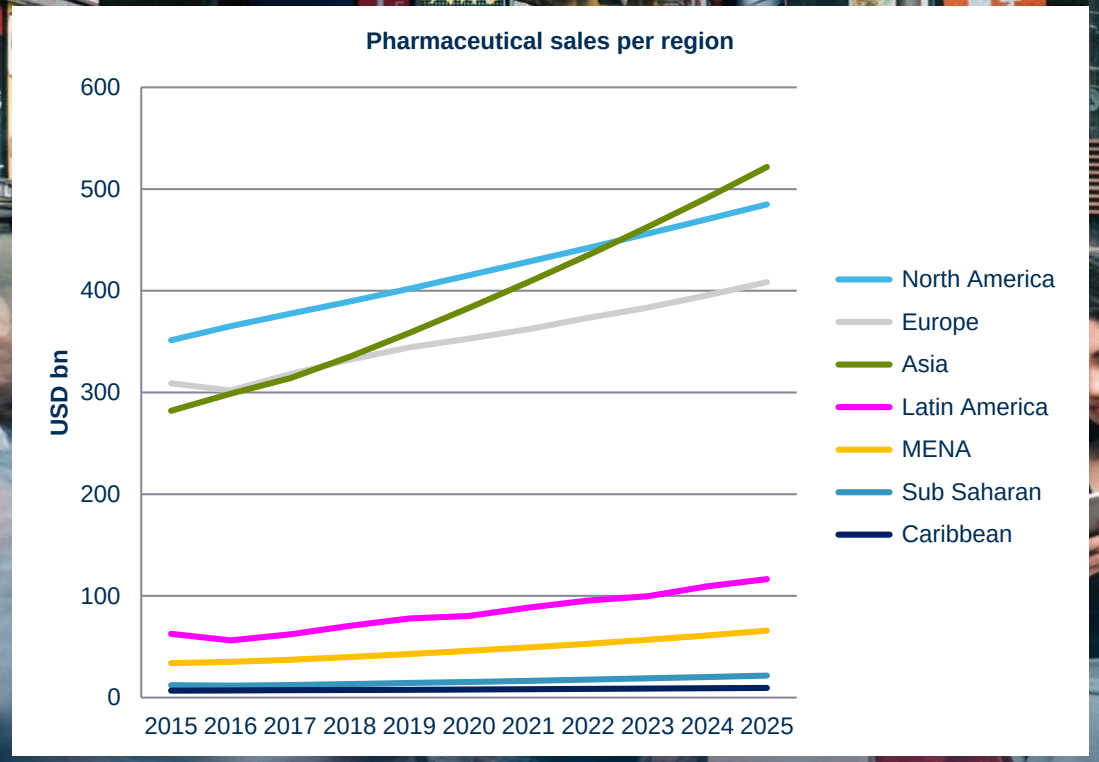
KUEHNE+NAGEL

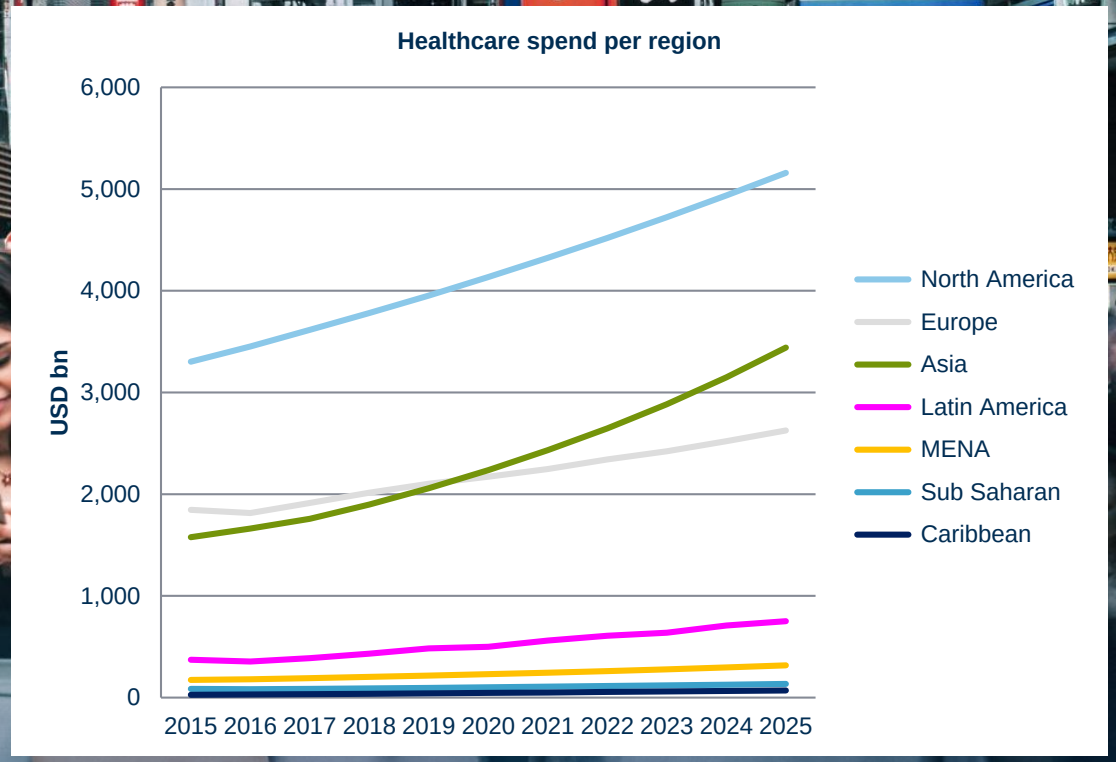
Reducing Pain in the Pharma Supply Chain

Juerg Meier

30-Oct-2019

IATA Airpharma Conference Amsterdam

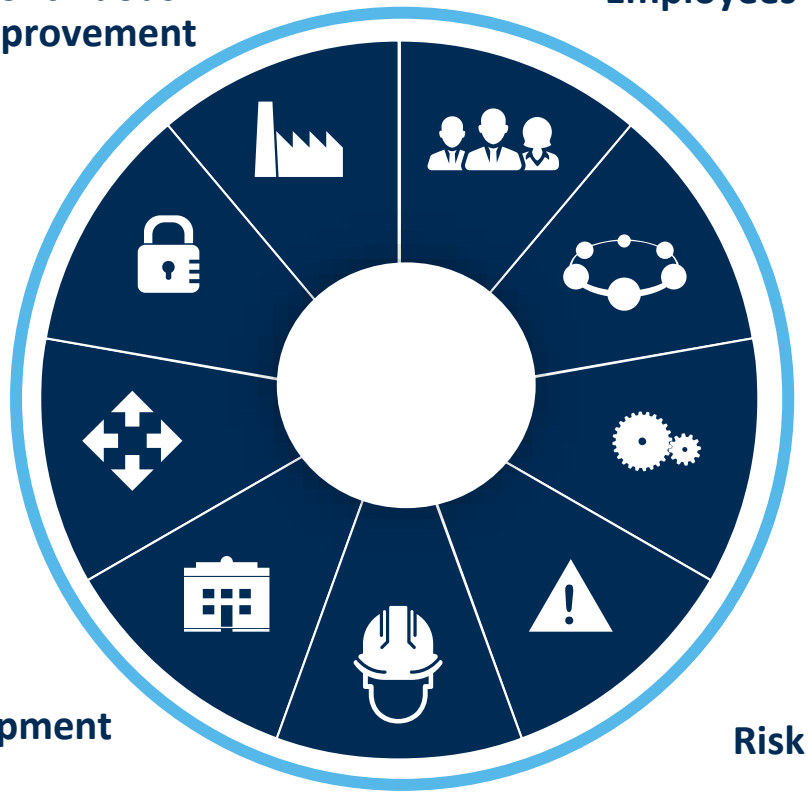




Emerging market Asia will incrementaly grow *while* *Europe & North America remain dominant*

Quality Management

Pharma & healthcare requirements ensured in KN PharmaChain program



KN PharmaChain value

Quality and compliance perspective

IATA CEIV Pharma development is positive with

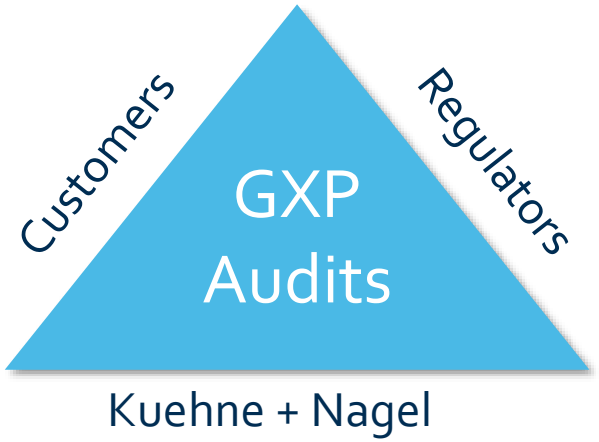
CEIV Pharma 324 operations fit for the pharma industry

Based on IATA data distribution of Supply Chain companies are following:

	2018		2019
Ground Handling Agencies	50		Ground Handling Agencies = 88
Freight Forwarders	153		Freight Forwarders = 193
Road Transport	8		Road Transport = 8
Airlines	16		Airlines = 21

Success story between airfreight and quality

Collaborative planning, design and execution



- Standardisation
- 48 sites certified
- Air and Overland

- Quality Expert Team
- Qualified Pharma auditors
- Same processes across all modes

- WHO TR 957, EU GDP, FDA, MHRA
- All transport modes
- >170 sites certified

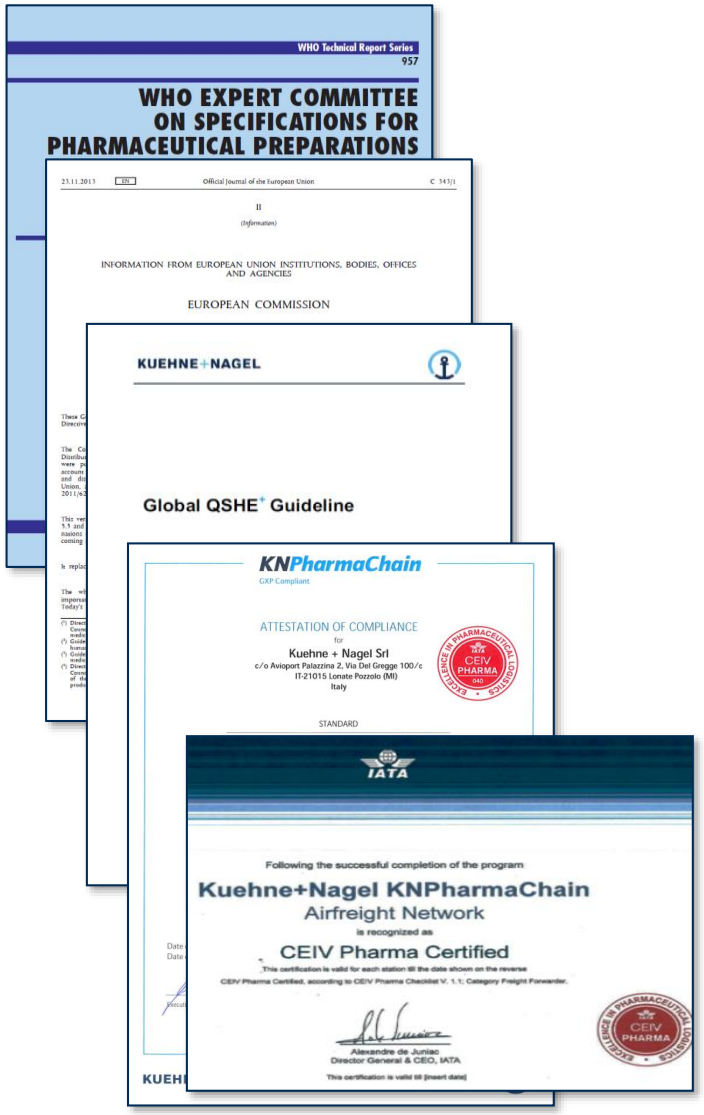
- Less lead-time risks
- Less deviations in the supply chain
- Better collaboration among partners

Upto 2013 | 2014 - 2018 | 2019

Quality management

Certification

- Kuehne + Nagel ***„Global GxP Policy Manual Pharma":*** Global framework and basis for regional, national and local procedures
- Kuehne + Nagel global Pharma & Healthcare standard is based on WHO GDP (No.957, 2010 / Annex 5). Where applicable / in addition regional / national GDPs (like EU GDP, FDA) are applied
- Some operations GDP certified by external certification body
- Kuehne + Nagel airfreight network is worldwide "IATA CEIV Pharma certified"
- Working instructions or SOPs for specific operations



In three years we built our air pharma CEIV network

To 94 sites and 50 countries with great acceptance by the pharma industry

KNPharmaChain

GXP Compliant

ATTESTATION OF COMPLIANCE

for

Kuehne + Nagel Srl

c/o Avioport Palazzina 2, Via Del Gregge 100/c

IT-21015 Lonate Pozzolo (MI)

Italy

EXCELLENCE IN PHARMACEUTICAL LOGISTICS IATA CEIV PHARMA 040

STANDARD

WHO Technical Report Series No. 957, 2010

Annex 5 WHO Good Distribution Practices for pharmaceutical products

The applied GXP Standard is based on specific criteria of the Kuehne + Nagel GXP Quality Management System which has been audited and found to be compliant according to WHO Standard outlined above.

SCOPE OF SUPPLY

BRANCH

Air Logistics

Airfreight incl. pre- and on-carriage

Date of attestation: 29 April 2015

Date of re-attestation: 27 April 2018

Valid until: 26 April 2021

Executive Vice President Air Logistics

Senior Vice President

Global Head of QSHE & Security

Kuehne + Nagel Management AG, Dorfstrasse 50, CH-8834 Schindellegi / Switzerland

KUEHNE+NAGEL

It's all about reducing risk to CEIV pharma shipments…

… by controlling risk of…

Physical damage
Temperature
Contamination
Loss/Theft

Authority findings
Data breach
Fines

Public incidents
Business Disruptions

… to build confidence and trust.

With IATA CEIV we improved

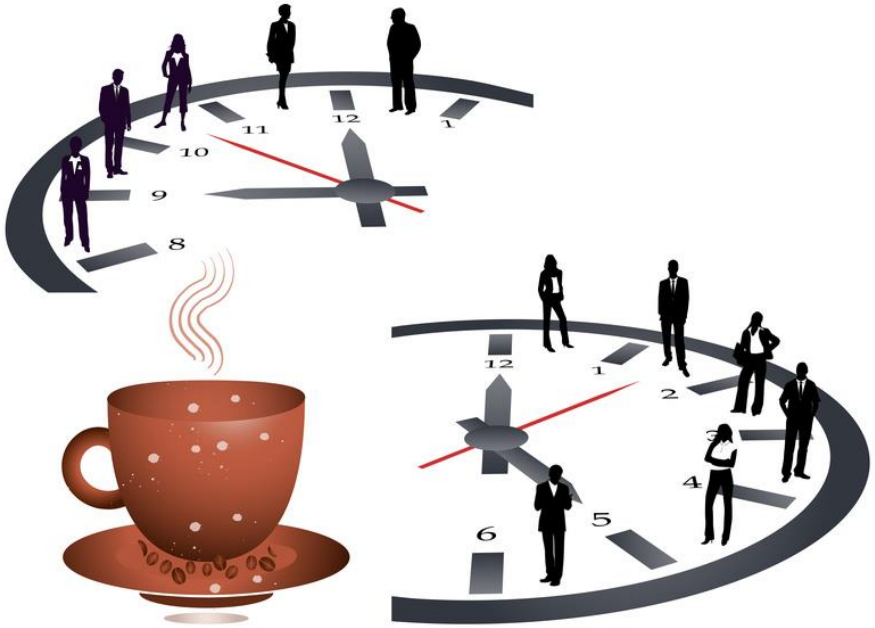
our pharma performance

- Approx. 10% better performance (basis: reported NCRs)
- Overall better understanding through awareness & trainings
- Improved customer satisfaction

Networking break 10:30 – 11:00

Kindly sponsored by;

40th Anniversary 1979-2019
VIKING
PACKING SPECIALIST



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How is improved technology benefiting supply chain logistics?

Ruud van der Geer
Assoc. Director Global Delivery Strategy Team,
EMEA Product Handling
MSD

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Drones, we are Future Ready!

Michael Zahra
President & CEO
Drone Delivery Canada

Ameet Sareen
GM Canada Sales
Air Canada Cargo

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Drones, We Are Future Ready !

DRONE DELIVERY CANADA.COM™

AIR CANADA CARGO

for

IATA

AirPharma Conference
Amsterdam, Netherlands

Oct 29-31, 2019

AC – DDC Agreement

DDC Overview

Drone Applications

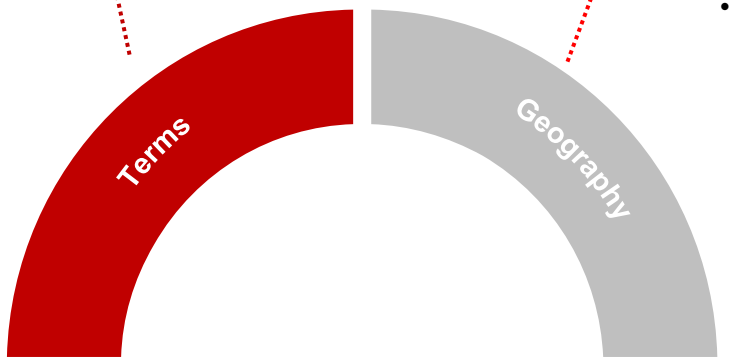
Launch Customers

AC – DDC Agreement

June 4, 2019 News Flash!!!

***Air Canada & Drone Delivery Canada Sign 10-Year Commercial Agreement**

- **One of its kind agreement globally**
- Air Canada will undertake **Sales & Marketing for DDC**
- DDC benefits from AC Cargo's global expertise
- National logistics network of up to 150,000 routes in Canada



- Agreement includes Canada with the **potential to expand** beyond Canada

#pharma

#Future

#Leading Edge

#cannabis

#Vision

#life science

#Early Movers

#Brand Value

#Made in Canada

#time critical

#food

#turnkey

#Economic Value

#Social Value

#Out of the box

#Across the street

#Just do it

#Endless opportunities

#Why not?

#Buz Development

#Across the pond

#New Revenue

#Across the province

#think big

#low risk

#innovation

#Across Canada

#Scalable

#yield

#Global Potential

#Northern Canada

#speed

DDC Overview

Drone Delivery Canada, based in Toronto, Canada, provides a complete turnkey logistics solution for delivering goods in *hard to access locations* and/or where *time is of the essence*.

First to Market

Autonomous UAV Software

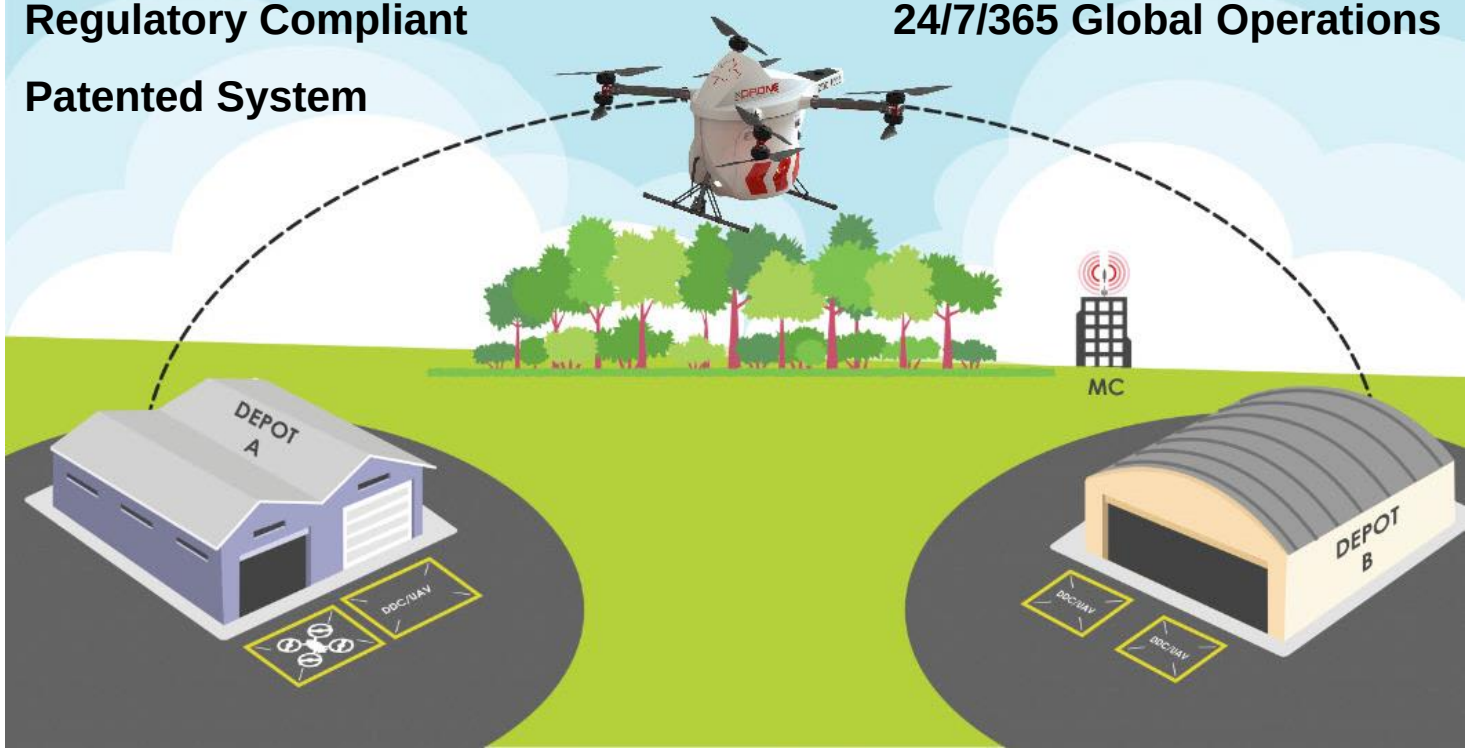
Regulatory Compliant

Patented System

Multi-drone fleet

Fully Commercialized & Operational

24/7/365 Global Operations



DRONE DELIVERY CANADA AT A GLANCE

First Mover in North America

- **First** B2B **ecommerce** drone delivery in North America, over **3 years ago**
- **Sparrow** deemed fully compliant in Dec 2017
- Federal license, **Compliant Operator Status Certificate**, awarded by Transport Canada Feb 2018
- Successful **BVLOS flights in *active* airspace -** Canada & USA
- **BVLOS flights with FAA** at Griffiss International Airport in New York, Mar 2018

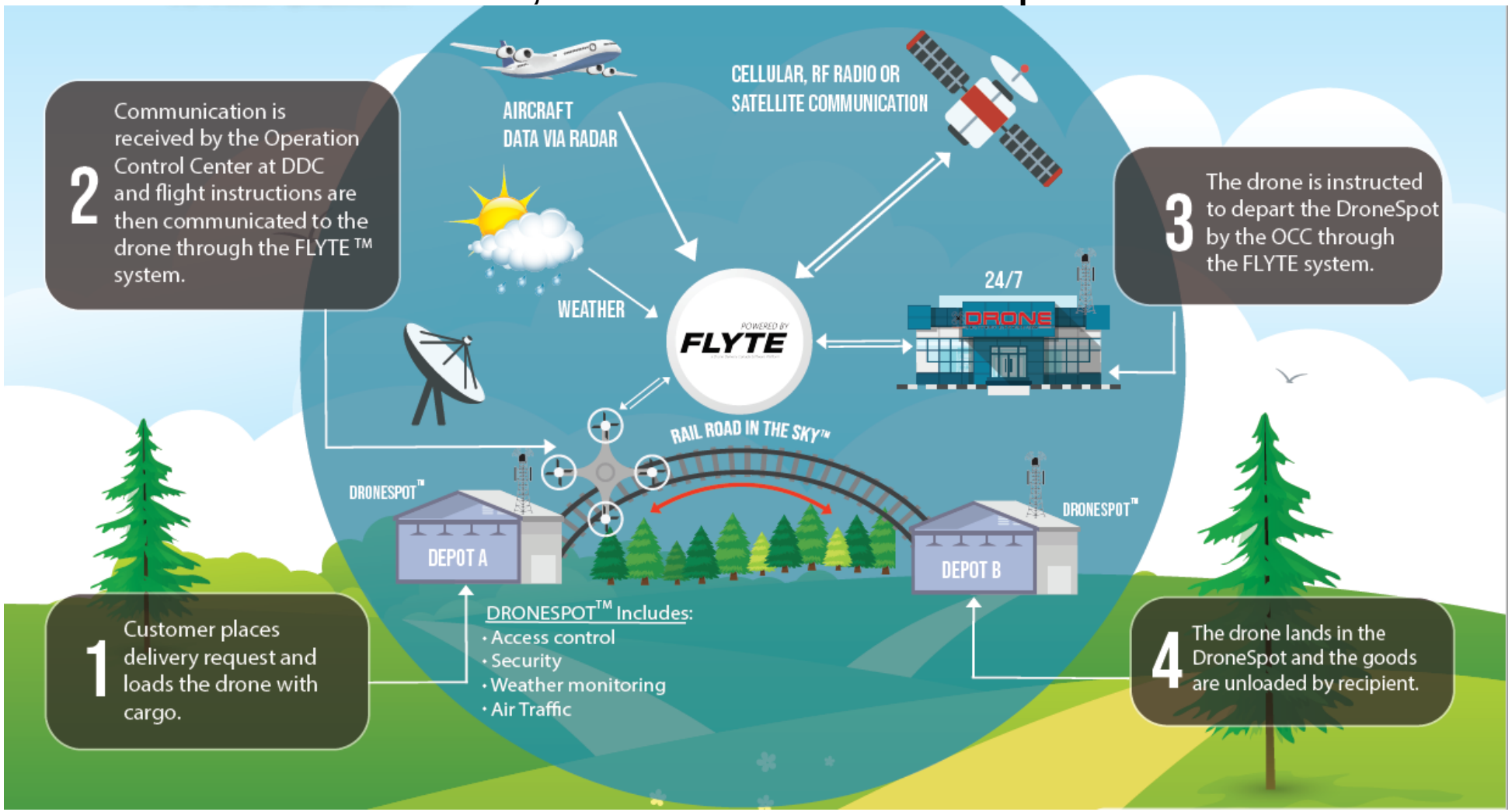
Strong Relationship with Transport Canada

- Started in collaboration with Canadian government on serving **remote Aboriginal communities** by drone
- We share our **testing data** and know-how to help establish regulations
- Experienced with TC's processes to achieve **rapid approvals**
- **TC experience translatable to other global regulators**

Commercialization Completed

- **Moose Cree First Nation** project finalized, starting late 2019 ($2.5M contract)
- **Actively signing customers -** implementations starting in 2019
- Advanced talks with over 50 **global accounts** - retailers, cargo networks, healthcare, pharmaceutical distributors, couriers, freight forwarders, port authorities, mail service providers, mines, oil & gas, etc
- Agreements with Toyota, Napa Auto Parts, Wolseley Canada, TECSYS, Peel Region Paramedics

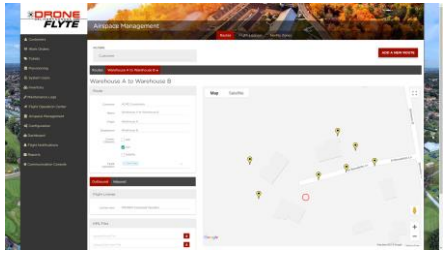
FLYTE is DDC's proprietary flight management software – delivering from depot-to-depot through a controlled, safe and secure autonomous process



DDC provides a complete turnkey logistics solution: software, hardware, infrastructure setup, training.

Operation Control Centre

- Centralized command centre for system monitoring and control
- Operators manage multiple drones, immediately scalable up to 1,500 total for the OCC
- Full monitoring & control over any UAV through FLYTE™ management system



Proprietary Software

- FLYTE software dispatches drones and manages overall system
- Visibility on various external factors (air traffic, weather, security, etc)
- Completely autonomous but a monitoring Operator can take control if necessary
- Route planning, scheduling, billing, PODs, maintenance records, etc.

Fleet

- Currently four DDC UAV models to service diverse payload and distance applications
- Sparrow, Robin, Falcon & Condor
- System is airframe agnostic with more UAV models coming

Drone Fleet

DDC Sparrow

- **Deemed compliant by Transport Canada, Dec 2017 – fully operational**
- 30 km distance, operating speed 70km/h
- 4.5 kg payload, 310 mm x 201mm x 140mm (WDH)
- Suitable for letters, small parcels, medical tests, medicine, emergency kits

DDC Robin

- **Expected entry into service early 2020.**
- 40 km distance, operating speed 75km/h
- 11.3 kg payload, 330mm x 228.6mm x 150mm (WDH)
- Suitable for letters, small parcels, medical tests, medicine, emergency kits

DDC Falcon

- **Expected entry into service date mid 2020**
- 50 km distance, operating speed 75 km/h
- 30 kg payload

DDC Condor

- **Expected entry into service date late 2020**
- Gas powerplant, rotorcraft
- 200 km distance, operating speed 120km/h
- 180 kg payload

A new way of getting supplies and equipment to your end user or within your operations

Efficiency

- Transporting urgent supplies to where you need them, when you need them.
- Pre-determined direct flight paths – depot-to-depot.
- Freeing up manpower and resources.

Cost Savings

- Significantly reduced maintenance and operational costs.
- Low operator and labour costs.
- Predictable, fixed monthly costs regardless of volume.

Reliability

- Reliable equipment you can count on. Affordable back up equipment readily and quickly dispatched.
- Comprehensive maintenance and spares programs available.

New revenue opportunities

- Capture new market share by expanding your service area to new regions or by improving SLAs
- Target new industries by increasing your service offering (remote access, speed, consistency, premium services, etc)

Drone Applications

The DDC platform is perfectly suited to a wide range of applications globally…

Vertical Market	Description
Canadian Remote Communities	~1000 remote communities in Canada, similar issues globally, move to suburban & urban as regulations permit
Mining	Time sensitive industrial cargo – repair parts, core drilling samples, water testing samples, emergency supplies
Oil & Gas	Time sensitive industrial cargo, on land and at sea – repair parts, emergency supplies, general cargo
Last-Mile Courier Routes	1000's of rural and suburban areas experiencing expensive and time-delayed delivery of general & e-commerce goods
Medical / Pharmaceutical	**AEDs, blood, medical tests, organs, prescriptions, emergency supplies, disaster relief, humanitarian aid**
Shore-to-Ship Logistics	Port-to-ship movement of cargo – repair parts, emergency supplies, documents, general supplies
Construction / Forestry / Agriculture	Movement of cargo in any expansive operational area


DRONE
DELIVERY CANADA.COM
AED DRONE

Launch Customers

Moose Cree First Nation (Rural/Remote Application)

About:

- Location: Northern Ontario
- Population: 5,000 people approximately
- Deal Value: $2.5M

Date announced: Dec 5, 2018
Start date: Q4 2019

Service:

- Mission: connect communities of Moose Factory and Moosonee flying over Moose River
- Value: (i) Huge social benefit, (ii) Accessibility of goods, (iii) Cost savings
- Drone type: Sparrow, 10lb of cargo payload
- Commodities include: medicine, postal, supplies, general necessities.

Vision Profile (Suburban Application)

About:

- Conglomerate focused on manufacturing building products
- Products: columns, decking, fencing, railings, patio doors, steel doors, etc
- Located: Vaughan, Ontario
- Population of Vaughan: 400,000 approximately

VISION™
EXTRUSIONS GROUP LTD.

Date announced: Sep 10, 2019
Start date: Nov 2019

Service:

- Mission: move commercial goods between different V facilities
- Value: (i) speed, (ii) cost savings
- Future potential: service over 20 Vision facilities
- Drone type: Sparrow application, 10lbs cargo capability
- Commodities: tools, parts, documents, general commodities

Global Transport and Logistics

About:

- Global Transport and Logistics company
- Employee Strength: 60,000 employees in more than 90 countries globally
- Drone Site Location: Milton, Ontario, Canada
  - New DSV Canada Head office (Air & Sea, Solutions and Road divisions)
- Workforce: Approximately 1,100 FTEs in peak seasons

Aim high. go far.

Date announced: Oct 23, 2019
Start date: Dec 2019 (early Jan 2020)

Service:

- Mission: First innovator in logistics industry to develop drone market
- Value: (i) Premium business development opportunity
  (ii) Speed of service
  (iii) Cost savings
- Drone Type: Sparrow application with 10lbs cargo capability
- Future Potential: Migrate to larger size drones (with increased capacity)
- Commodity: Time sensitive cargo across key verticals. Various commodities.

Edmonton International Airport (Urban/Airport Application)

About:

- Primary air passenger and air cargo facility in the Edmonton Metropolitan Region of the Canadian province of Alberta
- Edmonton is one of Canada's youngest cities and the fastest growing
- Canada's fifth busiest airport and largest major airport by land size
- One of the most progressive airports in Canada, and a leader in drone operations
- EIA is a founding member of the Alberta Aerospace & Technology Centre (AATC) - a center for research and innovation in aviation

EIA EDMONTON INTERNATIONAL AIRPORT

Date announced: October 29, 2019
Start Date: Q1 2020

Service:

- Sparrow application, migration path to larger drones
- Goods up to 5 kg to be commercially transported between facilities, on and off airport
- Cargo: could include letters, documents, general parcels, parts, pharmaceuticals

DRONE DELIVERY BENEFITS

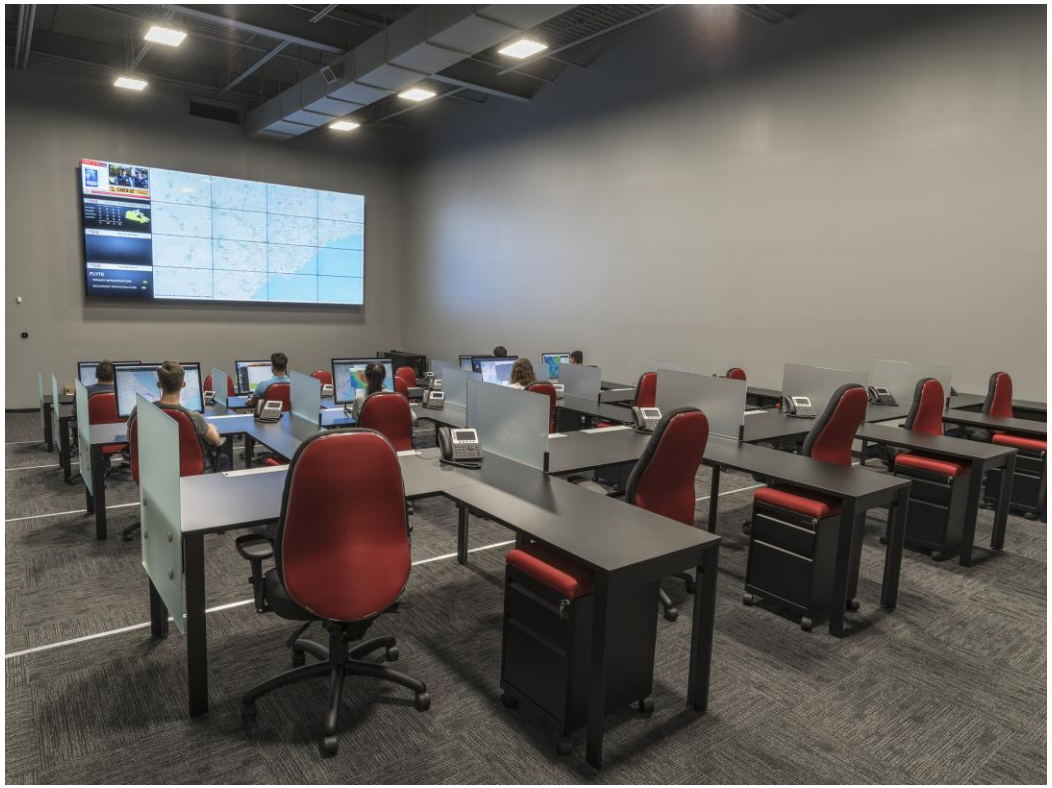
- Fast & efficient when time is off the essence
- Easy delivery to hard to access locations
- Secure & reliable
- Autonomous - low labour cost

Early adopter benefits – *because your competitors are moving forward…*

- Preparing to scale along with updated regulations
- Established relationship with regulators
- Developing processes & SLAs
- Competitive advantage
- Internal software integration
- New market share
- PR value
- Cost savings & efficiencies

WHAT TO LOOK FOR IN A DRONE LOGISTICS PARTNER ?

- ✓ *System* approach – it's <u>not</u> only about the drone
- ✓ Tested, proven, reliable & operational technology
- ✓ Full ownership of patented intellectual property
- ✓ Scalable in size & for global operations
- ✓ Multi-platform, airframe-agnostic technology for growth
- ✓ Fully operational, fully integrated SaaS system
- ✓ Approved by the Regulator to integrate into active airspace
- ✓ Secure, safe, disciplined and controlled operating environment



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Ameet Sareen

GM Cargo Sales Canada, Air Canada Cargo

www.AirCanadaCargo.com

ameet.sareen@aircanada.ca

Michael Zahra

President & CEO, Drone Delivery Canada

www.DroneDeliveryCanada.com

michael.zahra@dronedeliverycanada.com

Networking Lunch 12:30 – 14:00

Kindly sponsored by;

iSHARE

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Pharma digital is in fast-forward modus!

Has the industry the ability to change at the same pace?

Eddy Weygaerts

Transportation Manager

Pfizer

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O U R P U R P O S E

Breakthroughs that change patients’ lives

GLOBAL SUPPLY

Pharma digital is in fast-forward modus!

Has the industry the ability to change at the same pace?

Eddy Weygaerts

October 30th , 2019

GLOBAL SUPPLY

The simplicity of pharma

Product :

-Temperature
-Damage
-Intergrity

Is our biggest complextity

GLOBAL SUPPLY

Four Industrial Revolutions

1765

1st revolution

MECHANIZATION

led by the steam engine

1870

2nd revolution

MASS PRODUCTION

driven by electricity and oil-based power

1969

3rd revolution

AUTOMATED PRODUCTION

supported by electronics and information technologies

Today

4th revolution

NEW TECHNOLOGIES

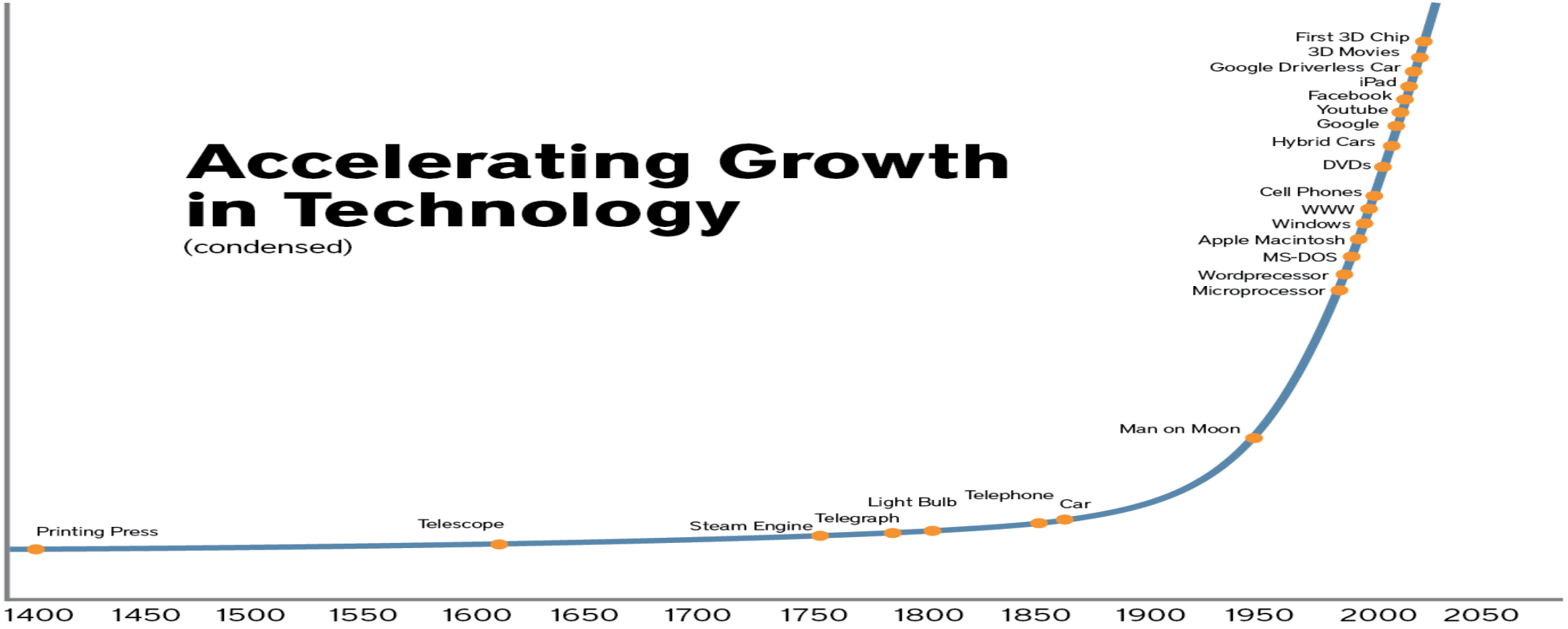
Internet of Things (IoT), Artificial Intelligence (AI); Big Data, Cloud, Cyber-Physical Systems...

Sources: https://www.visiativ-industry.ch/industrie-4-0/

GLOBAL SUPPLY

Accelerating Growth in Technology

(condensed)

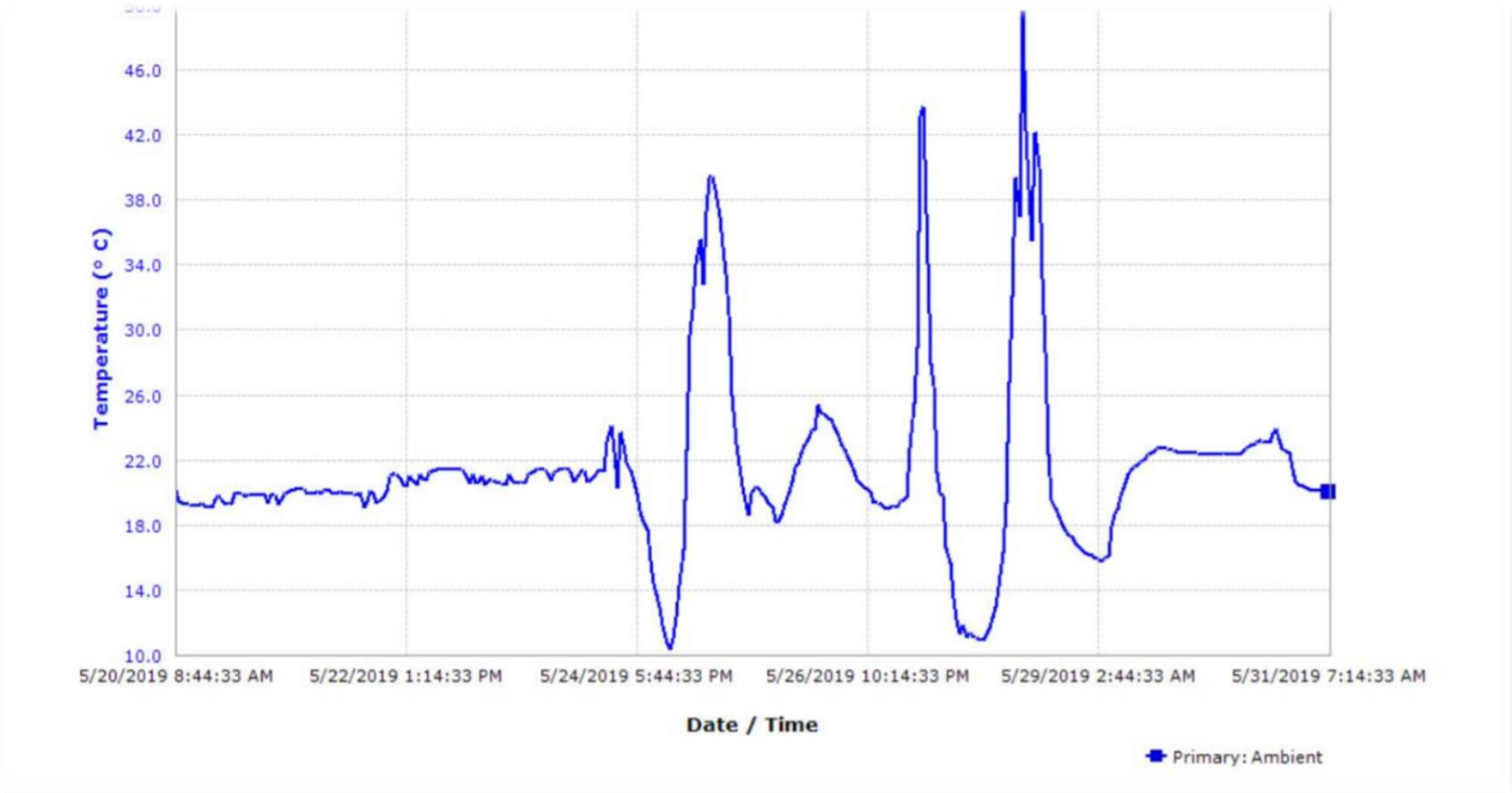


GLOBAL SUPPLY

Drawing in a cave

GLOBAL SUPPLY

Current Temperature recording

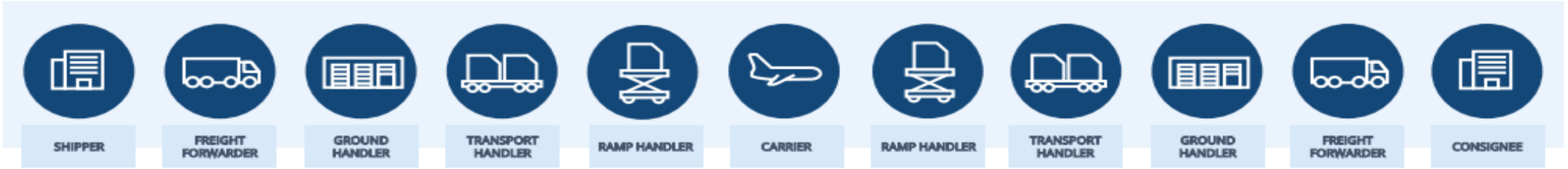


Temperature excursion landscape

GLOBAL SUPPLY

Analyzing temperature excursions

Challenges



- requires communication between multiple supply chain partners
- complex contractual relationships make direct communication difficult
- different types of information need to be exchanged
- information is locked in operational silos or only available on paper

GLOBAL SUPPLY

Test conclusions : ?

1/ Top of the iceberg

2/ Additional data is required

3/ More data means the need for data management

GLOBAL SUPPLY

Control tower output :

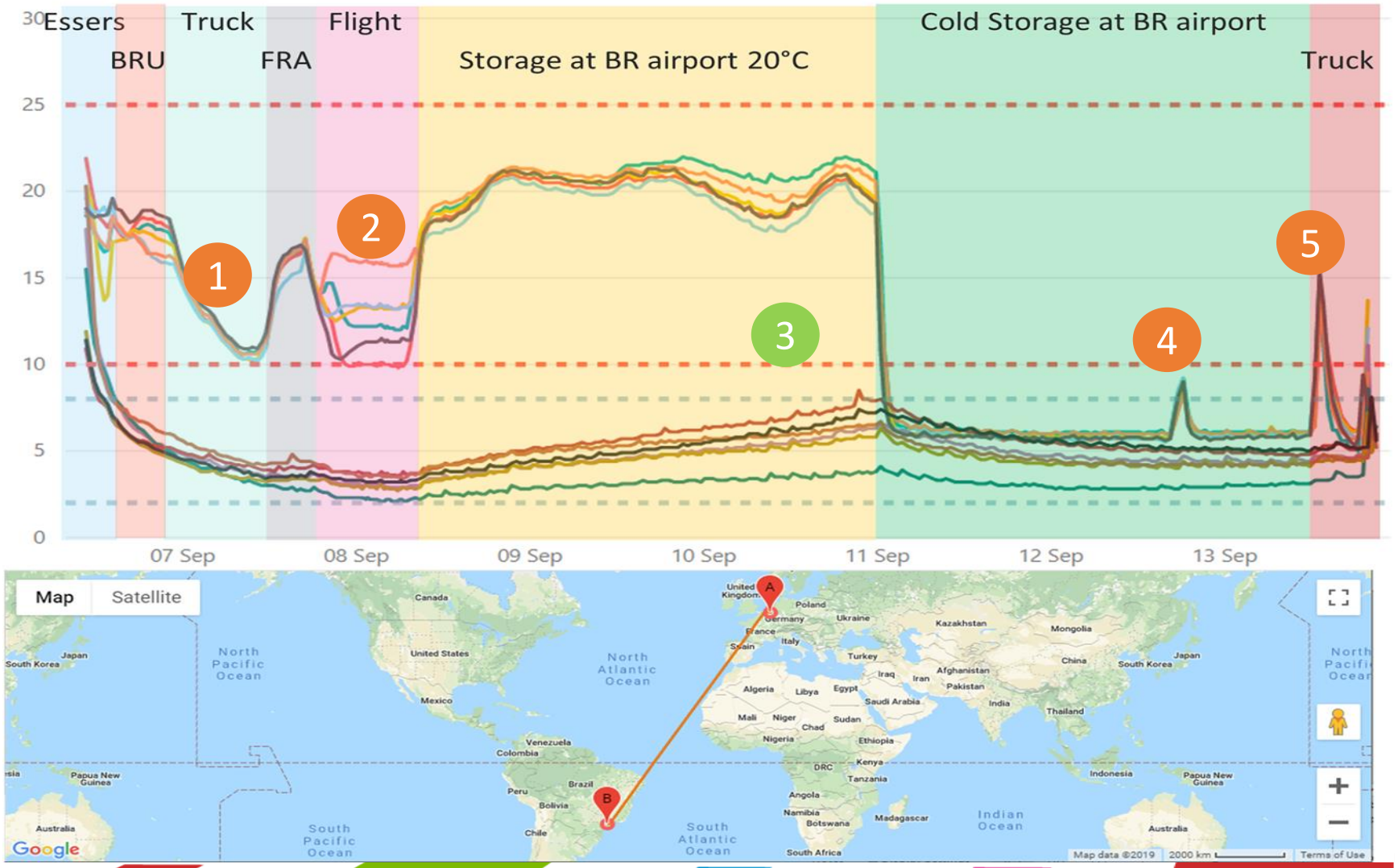
- not just a system or a technological platform

- not limited to logistics

- It will not fix issues

RTM (product +05°C / shipping +20°C)

Pfizer GLOBAL SUPPLY



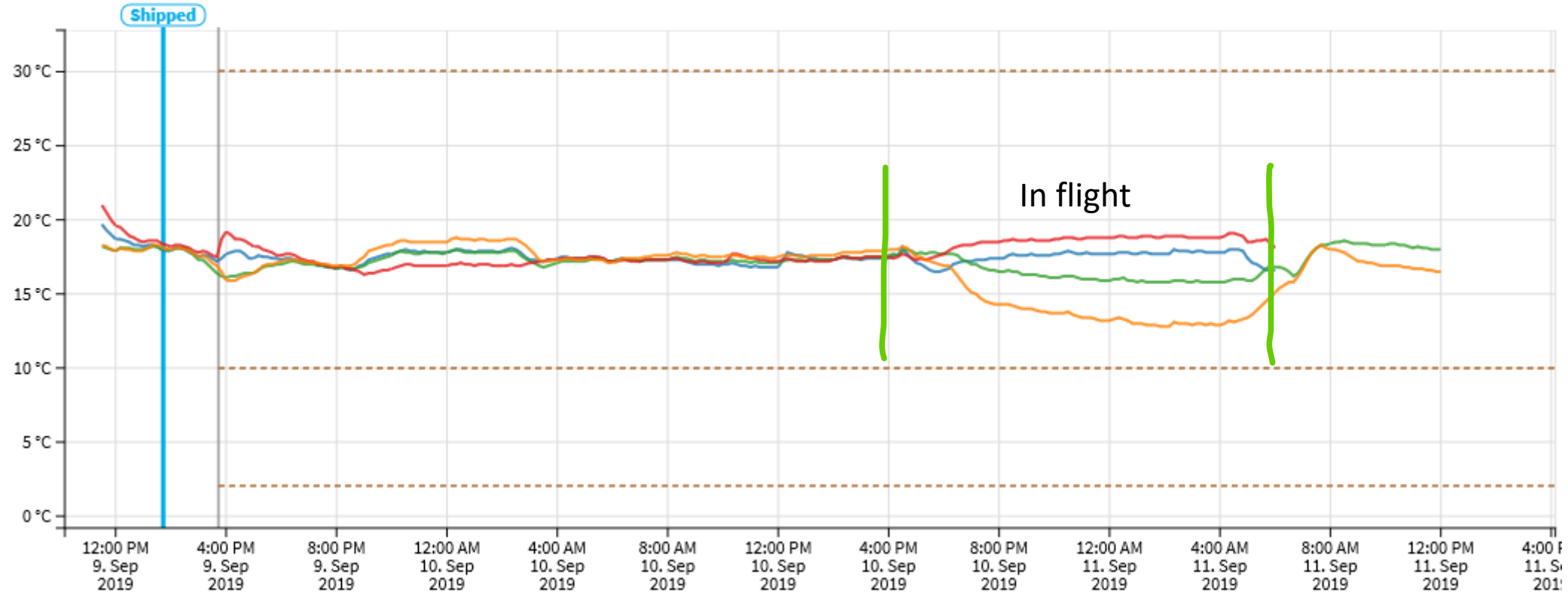
1 Truck temp at 11C instead of 20C – Malfunction

3 Shipment to be moved to 5C storage after 120h

5 Airport to LSP Wrong Setpoint 5C instead of 20C

GLOBAL SUPPLY

RTM Outside loggers 15-25°C shipment



GLOBAL SUPPLY

WHY ?

Pfizer GLOBAL SUPPLY

AI

Cell theraphy

Nanorobot

Collaborative Supply Chain Visibility in Air Pharma

Frank van Gelder
Secretary General
Pharma.Aero

Paul Delbar
Solutions Architect
Nallian

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IATA

PHARMA AERO
WE CONNECT PHARMA

nallian
data sharing for business collaboration

COLLABORATIVE SUPPLY CHAIN VISIBILITY

WE CONNECT PHARMA

PHARMA AERO
WE CONNECT PHARMA

Agenda

About Pharma.Aero

Project Digi 1.0 and Digi 2.0

The Global Pharma Tracker

Introduction to Pharma.Aero

A cross-industry collaboration for Pharma Shippers, CEIV-certified cargo communities, airport operators and other air cargo industry stakeholders to collaborate and enhance end to end air transportation of pharmaceuticals

Our vision, mission and goals

VISION

Achieve excellence in reliable end-to-end air transportation for pharma shippers

MISSION

Foster collaboration between CEIV certified airport communities dedicated in developing and leading when it comes to handling pharmaceuticals

GOALS

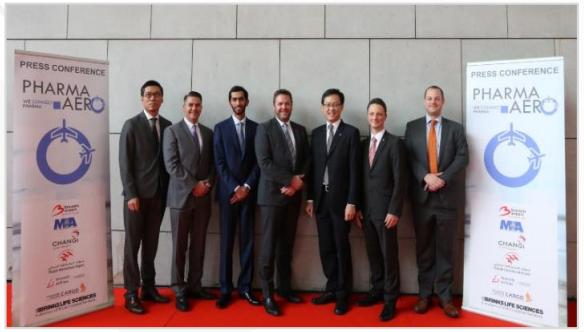
Advocate the best interests of the pharma industry

Develop air cargo as a reliable transport mode for pharma

Become leaders in developing cool chain solutions

Grow the pharma business at our airports

Our timeline



Founded in 2016 with Initial members: Brussels Airport, Miami International Airport, Changi Airport, Singapore Airlines, Sharjah Airport, Brussels Airlines and Brinks Life Sciences

PHARMA.AERO SIGNS MEMORANDUM OF UNDERSTANDING (MOU) WITH IATA

22 MAR 2018 | GENERAL

Dallas March, 2018: During the World Cargo Symposium of IATA in Dallas, Pharma.Aero and IATA signed a memorandum of understanding.

5 Completed and more ongoing Projects

Oct 2016

2017-2018

Present

Our current member base

FOUNDING MEMBERS

brussels airport – the heart of Europe

CHANGI airport singapore

MVD FREE AIRPORT

SPONSOR PARTNERS

ADVICE

e-CARGOWARE

Envirotainer – The Active Cold Chain

DuPont™ Tyvek®

INNOLABEL – Innovative Monitoring Labels

UNISYS

Validaide

va-Q-tec – ALWAYS THE RIGHT TEMPERATURE

STRATEGIC MEMBERS

Johnson & Johnson

Pfizer

MSD

zoetis

Chhatrapati Shivaji International Airport Mumbai

EIA – we'll move you.

MIA – Miami International Airport

香港國際機場 Hong Kong International Airport

مطار الشارقة Sharjah Airport

FULL MEMBERS

DHL Global Forwarding

CARGO SERVICE CENTER

CAIRO AIRPORT CARGO COMPANY

Expeditors

KIX Kansai International Airport

Düsseldorf Airport DUS

ALHA group

WFS – Worldwide Flight Services

PENTA Freight

TURKISH CARGO

AirBridgeCargo Airlines – Volga-Dnepr Group

الاتحاد ETIHAD CARGO

CATHAY PACIFIC

SINGAPORE AIRLINES

Ameriflet International Airlines

EuroAirport – BASEL MULHOUSE FREIBURG

Our accomplished projects

IATA CEIV SHIPPERS VALIDATION

Standardization & validation of the IATA CEIV Checklist by Pharma Shippers

AIRPORT AIRSIDE TRANSPORTATION SURVEY

A survey of common practices, measures and technological solutions in relation to the weakest link in the supply chain - the airside transport of pharmaceuticals

DIGI1.0: CERTIFICATION OF PHARMA AIR TRADE LANES THROUGH DIGITISATION

Conceptualisation and development of a logistics data-sharing platform for higher pharma supply chain transparency and performance

DIGI2.0: THE GLOBAL PHARMA TRACKER PROTOTYPE

Development of the Proof of Concept into a prototype – the Global Pharma Tracker (GPT)

Our ongoing projects

AIRPORT TO AIRPORT PHARMA CORRIDOR

Setting up pharma corridors between airports with cargo handling communities certified under the CEIV Pharma program

SECURITY STANDARDS FOR AIRFREIGHTING PHARMA

Harmonisation of Security Standards concerning pharma air transportation

AND MORE……..

PHARMA AERO
WE CONNECT PHARMA

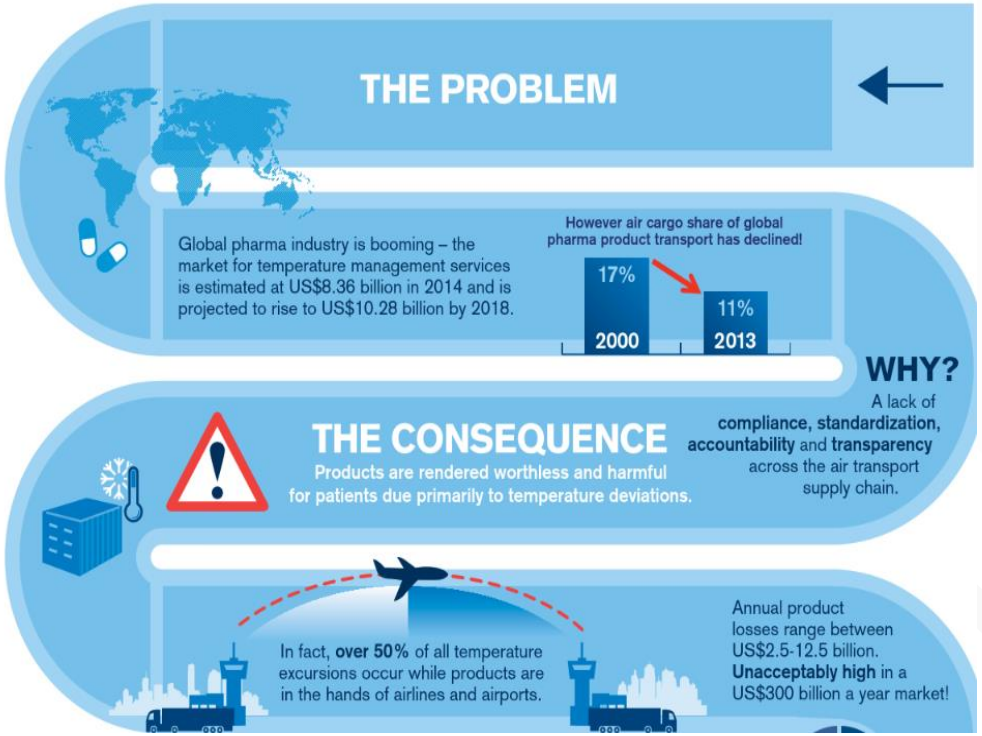
Agenda

About Pharma.Aero

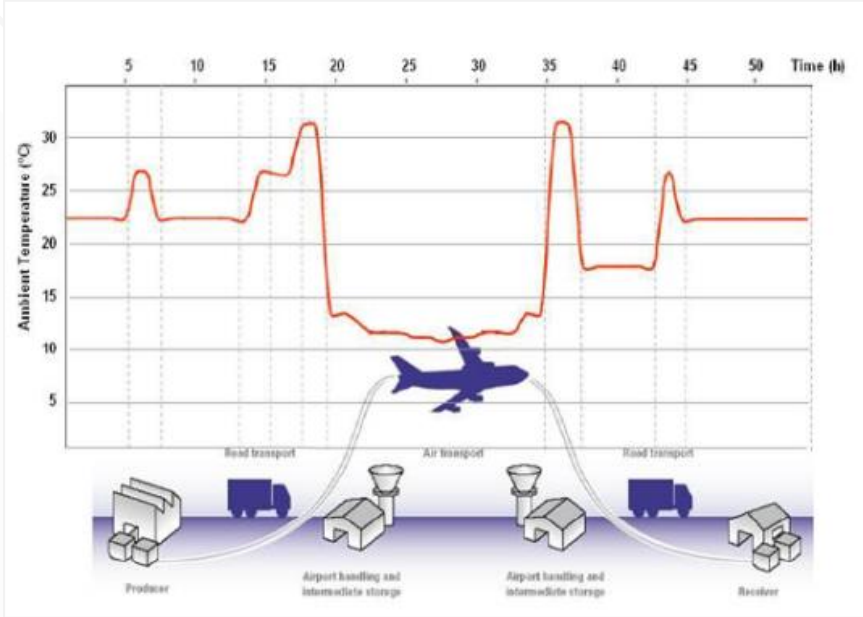
Project Digi 1.0 and Digi 2.0

The Global Pharma Tracker

Digi 1.0: The Problem Statement



INDUSTRY CHALLENGES



Digi 1.0: Critical issues raised by pharma shippers

Temperature excursions are often first detected **upon arrival** – too late

It can take **3 weeks or more** to collect all the relevant data

During this investigation, release into the market is **delayed** or **refused**

Cold chain issues can create a **modal shift** in pharma logistics

Digi 1.0: Root causes

Requires communication between **multiple supply chain partners**

Complex **contractual relationships** make direct communication difficult

Different **types of information** need to be exchanged

Information is locked in **operational silos** or only available on **paper**

Digi 1.0: Functional and System Requirements

FUNCTIONAL REQUIREMENTS	**Shipment Data**	**Status and Milestones**	**Quality Data**	**Temperature Data**
SYSTEM REQUIREMENTS	**Interoperability** offers flexible integration with current and future operational systems	**Immutability** ensures data is not modified	**Data Security** gives data owners control over who sees their data and in which situation	**End-to-End Visibility** provides stakeholders with enhanced visibility into the entire supply chain
	Better and faster visibility with less effort	**Single window to a single version of truth**	**Capability to prevent rather than respond**	**Happier customers!**

From Digi 1.0 to Digi 2.0

	DIGI 1.0	DIGI 2.0
	PROOF OF CONCEPT	**PROTOTYPE**
Data	Dummy shipments based on realistic data samples.	Live data from 2 batches of in total 22 real shipments. Data was provided by multiple live systems from each stakeholder, integrated by using a set of adapters.
Scope	Airport-to-airport	End-to-end: Shipper to Consignee
Business logic	Limited: focused on reproducing the Cargo iQ milestones in a linear timeline and ingesting quality data	Extended: focused on building the enhanced data stream of the entire cold chain process and cargo flow processes. Tying together the MAWB to HAWB to shipment batch number and even down to the specific Purchase Order (PO) number to provide interpretation context.
Data exploitation	Basic visualization	Additional functionality to enhance platform capabilities enabling prescriptive, and preventive actions by actors of the supply chain.

Digi 2.0: Prototype Lane

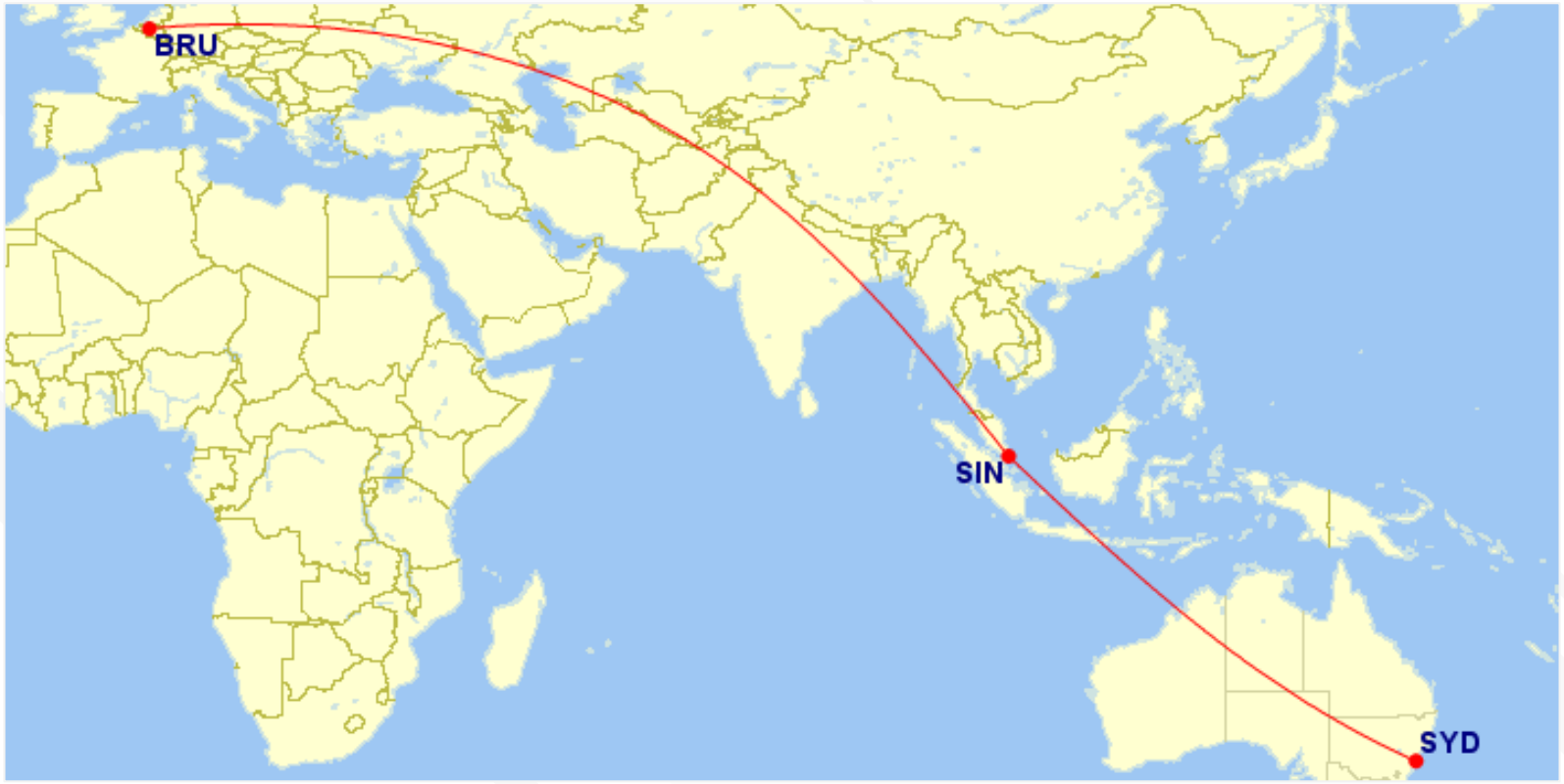
SHIPPER

FORWARDER

GROUND HANDLERS

AIRPORT

CARRIER



Digi 2.0: Project Scope

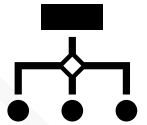
Work Package 1 — BUSINESS VALUE DRIVERS

- Identifying business value drivers from each stakeholder's point of view
- Review business value drivers from data perspective

Work Package 2 — TECHNICAL IMPLEMENTATION

- Designing data architecture
- Platform configuration to integrate various types of data sources, defining the output required of the GPT platform and incorporate processing logic

Work Package 3 — PILOT ONBOARDING



- Participation Note: outlines how different supply chain actors participate in the data-sharing platform

Work Package 4 — INFORMATION SYSTEM COMPLIANCE

- System security
- Compliance with legislative and regulatory measures

Digi 2.0: Lessons Learnt

- Balancing between perceived business value vs business risks
- End-to-End supply chain visibility requires change management and paradigm shift in thinking
- Stakeholder alignment is critical
- Executive and management buy-in and support
- Identification of Internal Sponsor to drive the participation

PHARMA AERO
WE CONNECT PHARMA

Agenda

About Pharma.Aero

Project Digi 1.0 and Digi 2.0

The Global Pharma Tracker

Global Pharma Tracker - Why

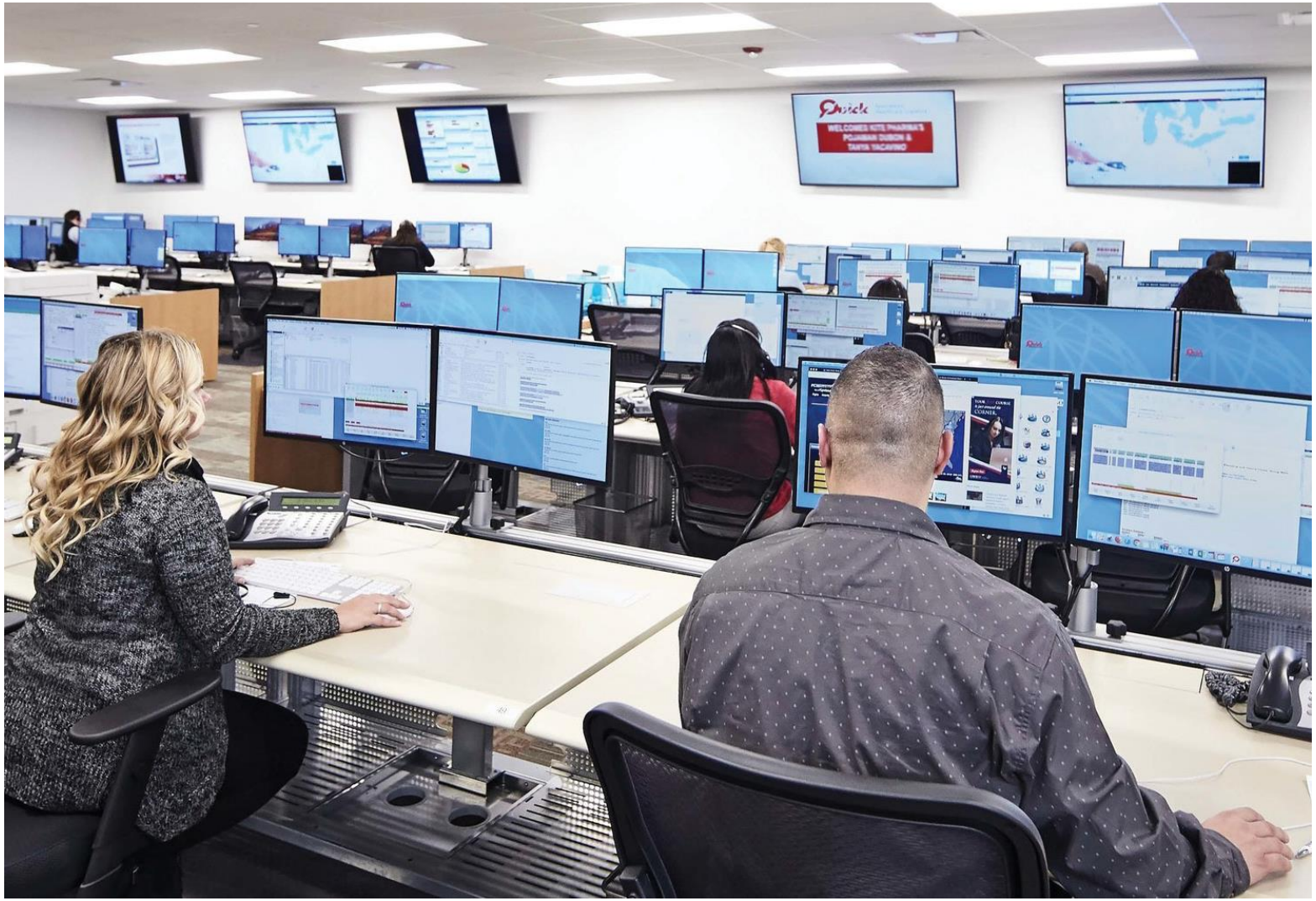
Global end-to-end logistics visibility

nallian
data sharing for business collaboration

What if pharma shippers had end-to-end logistics visibility?

- tracking a shipment from distribution center to final customer
- always knowing who is currently in charge of the shipment
- immediately detecting when the package is in the wrong place
- immediately detecting when shipment temperature is not optimal
- being able to intervene when something is about to go wrong

logistics visibility



Why is end-to-end logistics visibility so difficult to achieve?

packaging and sensor providers use their own web interface or app to provide real-time temperature info or to share logger data

each trucking company uses its own TMS providing real-time status and location updates on truck movements

forwarders provide information on transport and intermediate storage as well as summary carrier/booking information received from carriers

ground handlers provide status updates on key handover points in the logistics journey

airports maintain an online flight schedule and offer cold chain services such as cool dollies

carriers provide tracking information on their own website and keep the forwarder informed

To cover the entire logistics network, a **shipper** needs to

- setup **multiple integrations** with supplier systems
- **manually** consult tracking websites
- employ people to **call and email** to **collect and verify data**
- resolve **conflicting** information from many sources

And **every pharma shipper** does the **same thing** with the **same partners**

The business benefits of end-to-end logistics visibility

tracking a shipment from distribution center to final customer

always knowing who is currently in charge of the shipment

immediately detecting when the package is in the wrong place

immediately detecting when shipment temperature is not optimal

being able to intervene when something is about to go wrong

business benefits*

Simplified Excursion Analysis

Complete and reliable information is available when it is needed

- Less effort required to collect information on excursions
- Faster product release by qualified person
- Commercial value in faster delivery to customer / market

hindsight

Real-time Information

Key events and non-conformances are signaled automatically

- Additional visibility allows stakeholders to synchronize operational processes
- Ability to *prevent* issues from happening by preventive action
- Avoid logistics cost for compromised shipments

insight

Historical Performance Analysis

Database of parameterized historical performance

- Ability to leverage machine learning to predict risk
- Avoid under/overpackaging and associated cost
- Lane validation can be done based on data from **all** lane traffic, across multiple forwarders and shippers
- Simplified performance evaluation of the logistics chain

foresight

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* confirmed by a survey among Pharma.aero members

Global Pharma Tracker - How

Global end-to-end logistics visibility

an open and neutral platform
offering global end-to-end logistics visibility
for temperature-controlled pharma shipments

from factory to pharmacy

The Global Pharma Tracker Platform

Data integration

GPT can combine data from **all relevant sources**:

- shipper ERP
- transport and storage logistics service providers
- from road carriers thru forwarders to ground handlers and carriers
- authorities
- cold chain service providers including real-time location and temperature trackers

developed using Nallian's proven data sharing platform and leveraging its strong integration capabilities

nallian

The Global Pharma Tracker Platform

Data integration

provides information about customer order references, expected temperature regimen, product packaging and attached data loggers at house bill level

SHIPPER

provides additional packaging information, aggregation into master airway bills, intermediate transport and storage conditions and additional data loggers

FREIGHT FORWARDER

provide info on aggregation into ULD and flight manifest, storage, buildup/break down and transport conditions and timing as well as CEIV quality acceptance checks

GROUND HANDLERS

provides ambient temperature, flight schedule and movement information, access to local cold chain service providers such as pharma dollies and storage facilities

AIRPORT

provides flight schedules, master data on ground handler capabilities, access to operational messages around the physical and data flow surrounding shipments

CARRIER

provide real-time or batch sensor information including temperature, humidity, location, door open/close … for sensors linked to (part of) a shipment

COLD CHAIN SERVICE PROVIDER

developed using Nallian's proven data sharing platform and leveraging its strong integration capabilities

nallian

The Global Pharma Tracker Platform

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COLD CHAIN SERVICE PROVIDER

GPT API

BACKEND IT SYSTEMS

GPT EXPLORER

PRIVATE DATA LAKE

developed using Nallian's proven data sharing platform and leveraging its strong integration capabilities

nallian

GPT's output is an **enhanced data stream**, available to all logistic partners who are part of the shipment journey, which allows them to

- increase visibility
- optimize processes
- enhance service quality

The Global Pharma Tracker Platform

Data integration

The Global Pharma Tracker Platform

Shipment levels

Global Pharma Tracker turns data into information by aggregating, interpreting and structuring information from various sources.

To provide the enhanced data stream, GPT's **business logic** uses

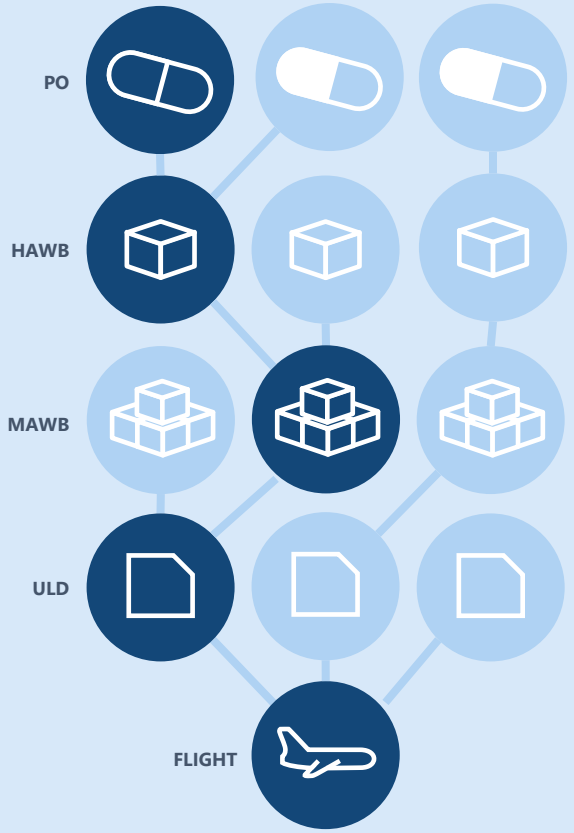
- a structured network representation of the global pharma logistics grid
- an interpretation and representation model for the various important logistics milestones
- master data which can be used to correct, augment and validate information.

Making sense of shipping information can be complicated. Messages can be incorrectly formatted, received twice or not at all. Information can come in the wrong order, missing the necessary timestamps to correctly interpret them.

GPT's intelligence combines data from multiple sources and multiple shipments to identify information that does not make sense and could lead to false tracking results.

GPT BUSINESS LOGIC	the heart of Global Pharma Tracker, capable of handling complex situations such as rerouting, multi-model/multi-hop carriage, part shipment …
GPT GLOBAL NETWORK MODEL	a digital representation of the logistics grid used for pharma shipments and every connected logistics participant on the GPT network
GPT PHARMA MILESTONE MODEL	a structured approach to interpreting the information for every shipment, leveraging Cargo iQ and augmenting it with events with a high relevance for pharma shipments
GPT MASTER DATA	a catalog of capabilities for each participant in the supply chain: relations between carriers and ground handlers, airport layouts to help interpret geo-location data, cold chain capabilities …

GPT allows tracking at every relevant aggregation level:



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GPT Data Governance

GPT's data sharing and governance rules are defined by its user community

Building on the base framework established by Pharma.aero and its members during Digi 2.0

All data shared on the GPT platform is owned by its data provider

The data owner decides on the data sharing and governance rules the platform enforces on their behalf

Shared data is used only for the purpose explicitly approved by its owner

GPT will not sell, rent or otherwise exploit the data for any other purpose

GPT is an open, service-provider agnostic platform

It is not tied to any particular shipper, forwarder, carrier or airport

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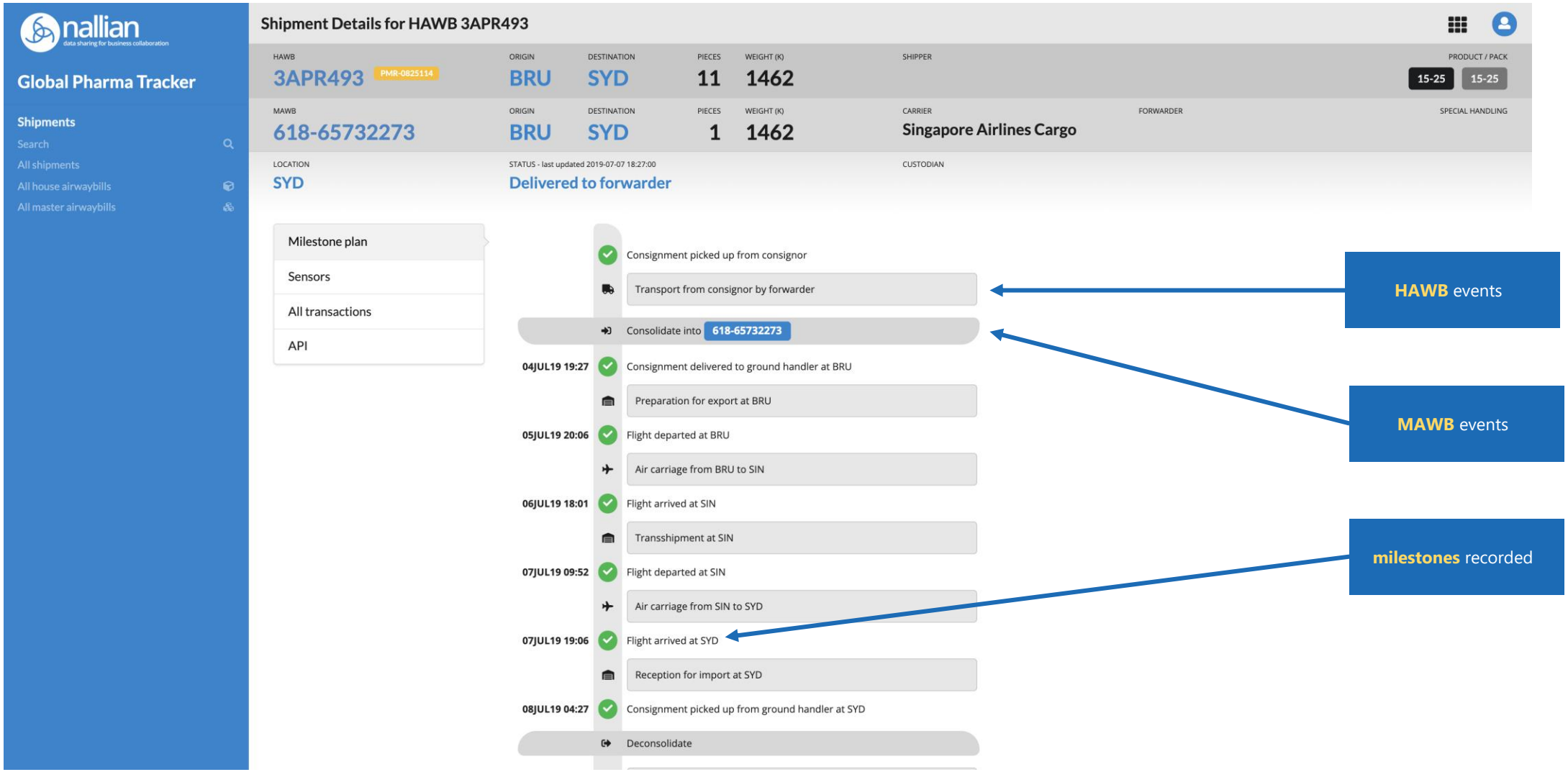
data sharing for business collaboration

Global Pharma Tracker

GPT Explorer example



Global Pharma Tracker

GPT Explorer example

Global Pharma Tracker

GPT Explorer example

Milestone plan

Sensors

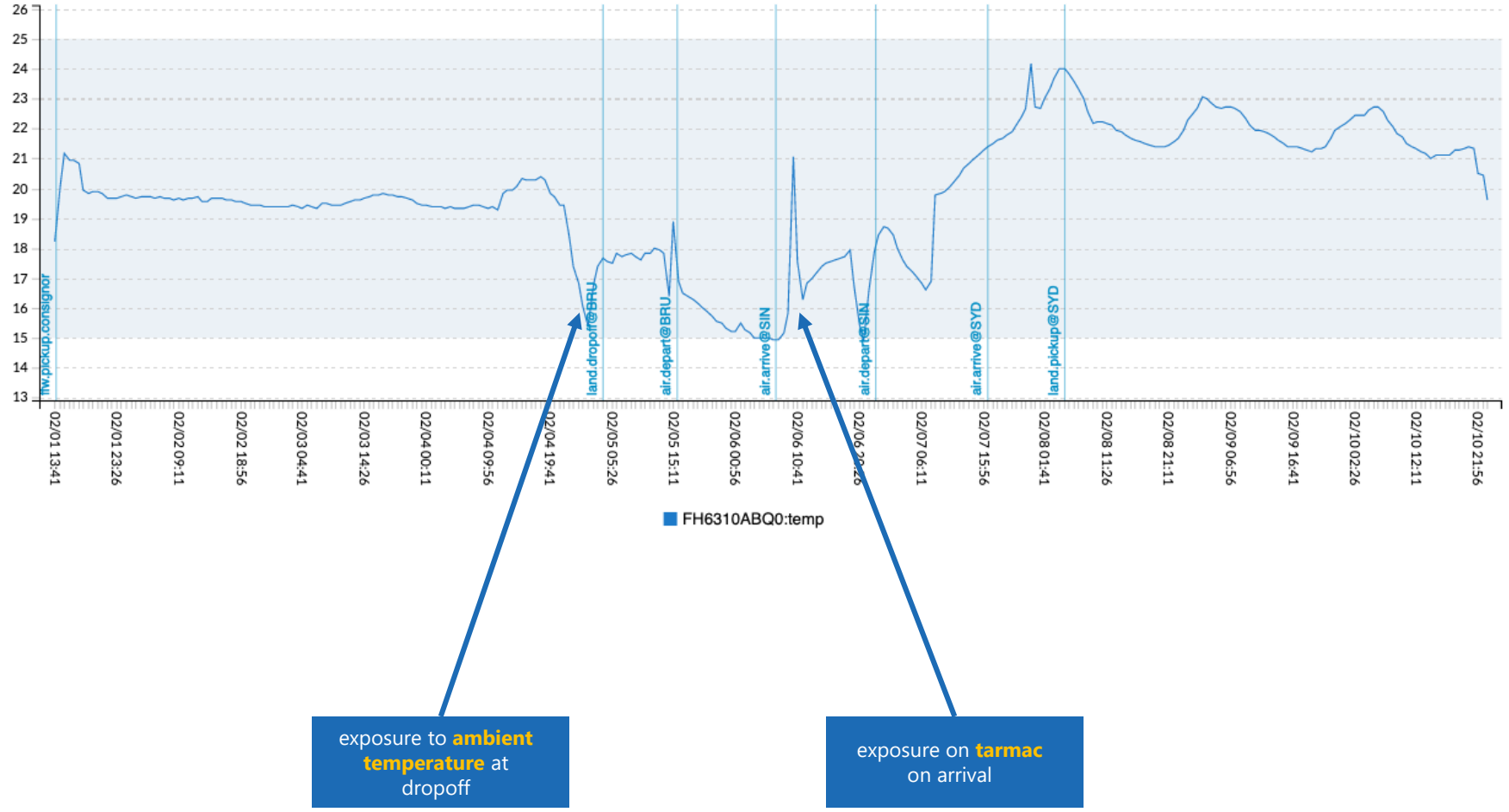
20009DE4	SMARTSENSOR
FH6310ADP0	TT4
FH6310ABQ0	TT4
FH6310B640	TT4
FH6310B4N0	TT4
FH6310B4D0	TT4
FH6310AD60	TT4
FH6310B4Y0	TT4
FH6310B4J0	TT4
FH6310B4E0	TT4
FH6310AEB0	TT4
FH6310AE20	TT4
FH6310ACK0	TT4
	TT4

All transactions

API

Placed on pallet #2

2019-02-01 13:41:57 - 2019-02-10 23:26:57 **14.89** - **24.17**

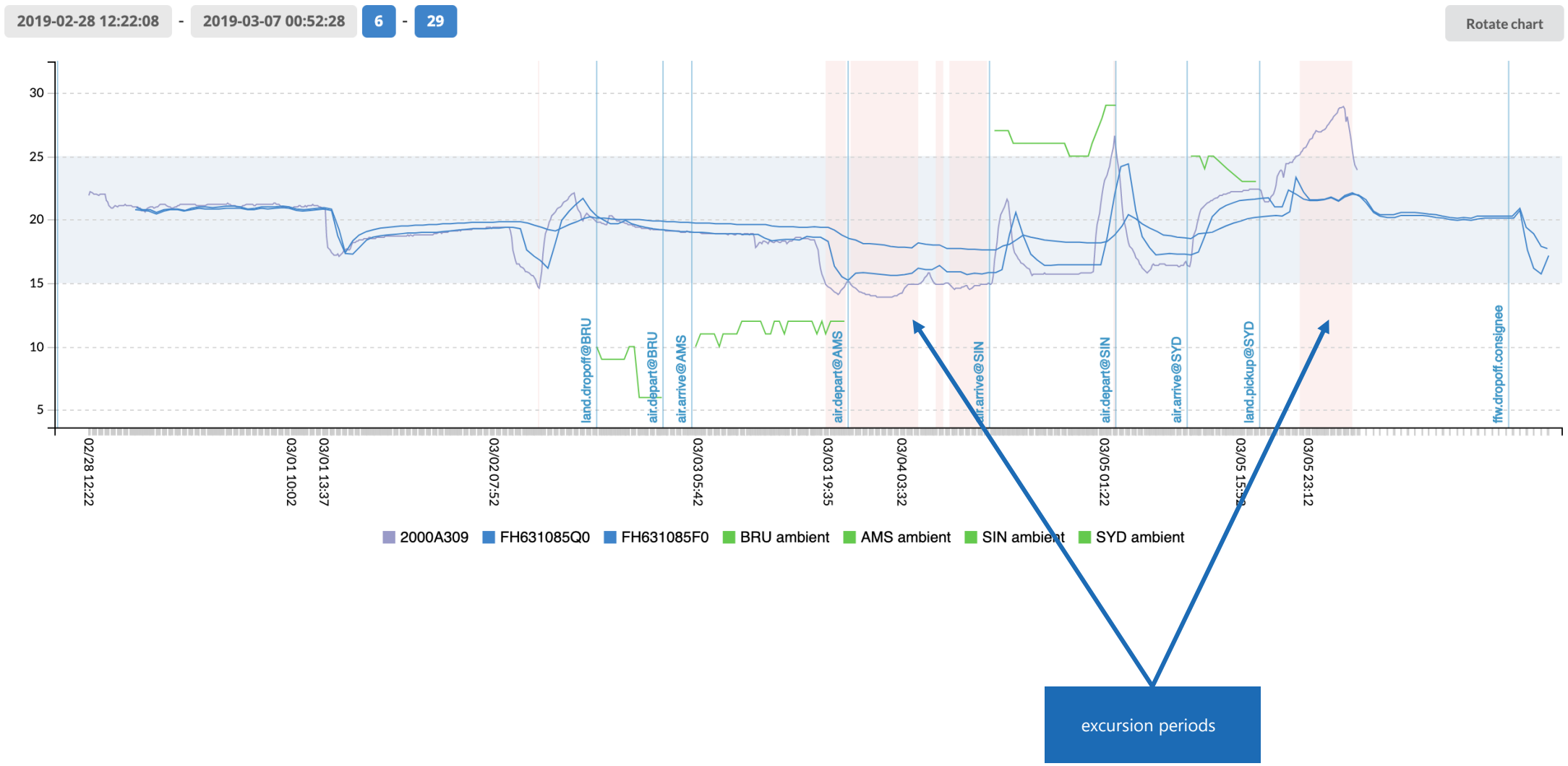


exposure to **ambient temperature** at dropoff

exposure on **tarmac** on arrival

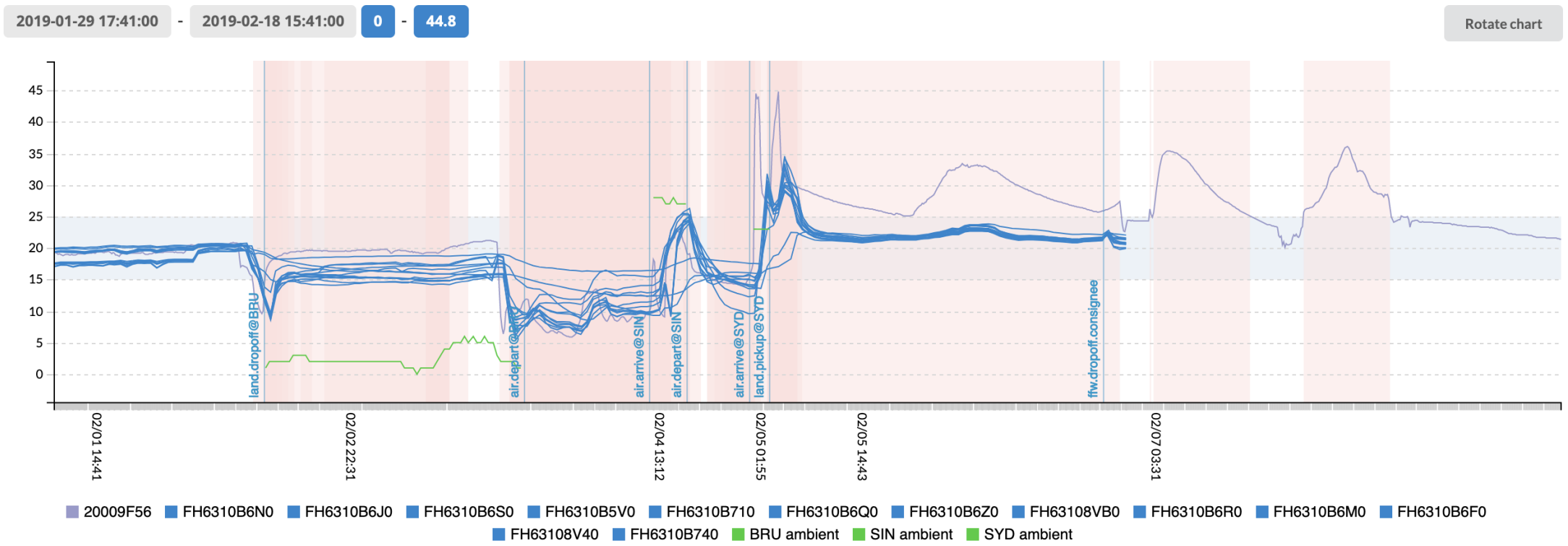
Global Pharma Tracker

GPT Explorer example



Global Pharma Tracker

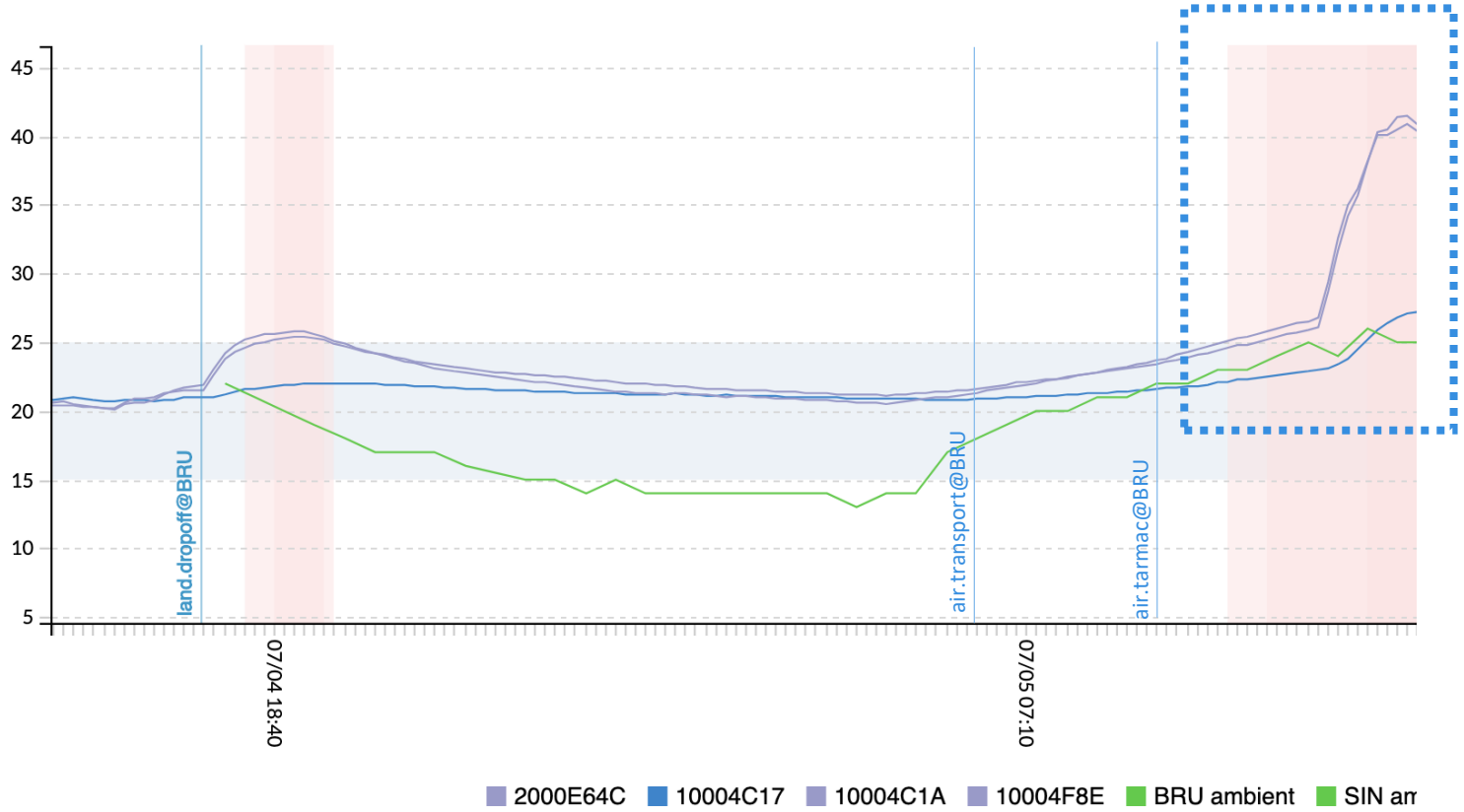
GPT Explorer example



Real-time data: the need for context

FACTS external temperature above range, internal temperature trending to upper limit

CONTEXT 15-25°C shipment under thermal jacket, shipment due to depart at 20:06, part of a single ULD, 2 sensors providing external temperature, 1 internal, on tarmac



Where is my shipment – on the warehouse, on transport, on tarmac, in the plane?

Who is currently holding my shipment?

What is the **capability** of that party to intervene?

How should they **react** to this situation?

Integrating real-time data

Benefits

FACTS

Information needs to provided in a reliable and **automated** way to minimize control tower workload

All information needs to be provided in a **single, consolidated and coherent view**

Additional digital signals need to be developed in the 'hot zones' (which is **everywhere**)

CONTEXT

Information needs to be interpreted **in context** to resolve missing or contradictory information

A notion of **criticality** needs to be defined to prioritize the attention of the control tower

An extended model for **product or shipment viability** can use multiple inputs to assess the situation

Uses a **milestone planning** model to predict the future timeline (useful in case of delays)

ACCESS

Where possible, the platform needs to **notify the appropriate parties** without intervention of the control tower

Agreements need to be made to ensure that operational parties are able and willing to take action

STRATEGY

Scenarios need to be defined on how to handle specific situations such as on-tarmac excursion, in-warehouse excursion, apparent rerouting of shipments …

These need to **be in place and practiced** prior to issues happening

Global Pharma Tracker – Today

Global end-to-end logistics visibility

Participating in the Early Adopter Program

Benefits

The **Early Adopter Program** is a unique opportunity for forward-thinking pharma shippers and logistics service providers to **improve their logistics performance**

EAP participants

- will be able to define the **initial pharma logistics grid** to be covered by Global Pharma Tracker
- establish the first set of **end-to-end lanes** to take advantage of the augmented visibility offered
- drive **roadmap priority** to maximize return from their participation

SHIPPER

- provide your control tower with an end-to-end logistics view
- single platform to track all shipments across forwarders and carriers
- drastically reduce time spent researching temperature excursions
- allow Qualified Person to release shipments faster
- reduce temperature excursions by raising awareness

FREIGHT FORWARDER

- easier access to milestone information to feed your control tower
- use the enhanced data stream to provide better track & trace
- resolve the 'black hole' visibility issue
- provide faster response to shipper information / CAPA requests
- demonstrate strong commitment to supply chain transparency

GROUND HANDLERS

- improve your temperature-controlled logistics offering
- reduce administrative effort to respond to information requests
- support SLA and claims discussions with factual data
- leverage internal IT investments by sharing milestone data
- become more attractive to carriers with a strong cold chain portfolio

AIRPORT

- substantiate cold chain capabilities with factual data
- provide cold chain carriers with GPT as 'soft infrastructure'
- actively build cold chain corridors complete with end-to-end tracking
- promote local cold chain services such as pharma dollies
- leverage logistics data for local community process optimization

CARRIER

- improve your temperature-controlled logistics offering
- reduce administrative effort to respond to information requests
- participate in cold chain corridors complete with end-to-end tracking
- better understand actual KPI-related performance of partners
- become more attractive to pharma shippers and reduce modal shift

COLD CHAIN SERVICE PROVIDER

- promote your service offering to wider range of customers
- substantiate SLA and claims discussions with factual data
- reduce customers' manual effort to integrate sensor data
- trackers: facilitate product adoption by providing unified integration

The Global Pharma Tracker Network

The GPT network is a **distributed model** for air cargo logistics, which maximally leverages any data already available in local airport communities

The model **integrates all available data** to provide end-to-end visibility across the entire global air pharma logistics grid

Network **nodes** are added as airports, carriers and forwarders provide data on logistics events at these nodes

The information creates **lanes** which make it possible to provide end-to-end shipment tracking

Nodes will start out with **basic visibility**, providing only high-level logistics and temperature information for simple tracking

Gradually, GPT will work with airports and local partners to **increase the available data depth** to reach complete coverage

During the **Early Adopter Program**, the priority for network development will be defined by the participating logistics partners

Global Pharma Tracker

Development Roadmap

2019 - Early Adopter Program

Selected participants will define the **initial pharma logistics grid** to be covered by Global Pharma Tracker, and will establish the first set of end-to-end lanes to take advantage of the augmented visibility offered. Pharma.aero members will profit from favorable conditions

Capabilities

- define and track shipments at house and master airway bill level, including by shipper / customer references
- provide milestone plan covering all key Cargo iQ milestones, supporting multi-hop and road feeder segments
- include CEIV Acceptance Check results
- support common temperature control SOPs including active containers
- overlay product temperature loggers (passive and active) with logistics milestones to identify location and custodian at every step of the flow
- flag temperature excursions and anomalies in data or logistics flow
- provide GPT Explorer as the basic interface to consult GPT data
- support a participant profile to identify commercial relations, agreed upon standard operating procedures and capabilities
- definition of data capability measures on nodes and lane segments to drive continuous extension of the network
- provide an open interface for sensor data integration to support an active ecosystem of cold chain service providers of passive / active sensors and pharma transport dollies

Additional features may be suggested by Early Adopter Program participants

2020 - General Availability

Sign up additional airports and local partners to **increase the available data depth** to reach complete coverage

Capabilities *

- additional milestones for regulatory and customs processes
- additional milestone granularity during build-up / break down of shipments and on-tarmac time
- milestone propagation and notification of missed or critical milestones
- advanced backend system integration using publish / subscribe mechanism to automatically receive updates
- support for ONE Record standard
- possibility to book cold chain services through the platform
- provide interoperability with other community systems and platforms

Future

In its first release, Global Pharma Tracker supports fine-grain, real-time shipment monitoring and tracking, to maximally reduce temperature excursions.

In future releases, Global Pharma Tracker will support dynamic guidance of optimal packaging and lane selection, using a predictive model derived from anonymized historical data.

We will continue to expand the reach of the Global Pharma Tracker Network to cover all relevant pharma air logistics lanes and destinations.

* Please note that the priority and timing of features on this roadmap is subject to Steering Committee decisions.

Global multimodal pharma logistics monitoring

Currently, Global Pharma Tracker focuses on **air** and **road feeder** logistics

Global Pharma Tracker will be **extended** to cover other modalities such as **ocean** and regular **road** transport

Global Pharma Tracker

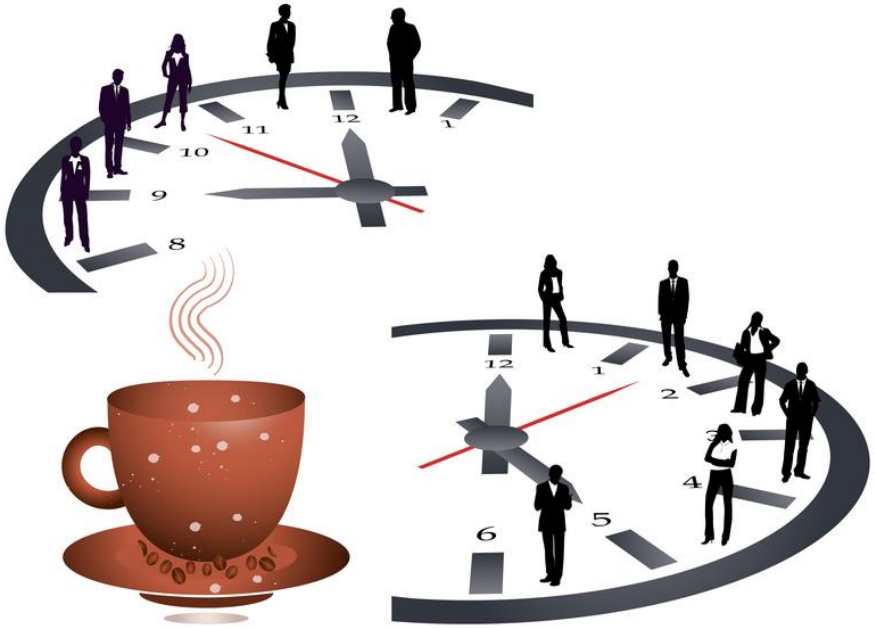
Global end-to-end logistics visibility, from factory to pharmacy

nallian
data sharing for business collaboration

Networking break 15:30 – 16:00

Kindly sponsored by;

40th Anniversary 1979-2019
VIKING
PACKING SPECIALIST



Joint Session

Air Pharma and Air Cargo Operations

Moderator: Bart Pouwels, Head of Cargo, Amsterdam Airport Schiphol

Panelists: Fabrice Panza, Cool Chain Project & GDP/QA Pharma Manager, AFKLM Cargo

Robert Fordree, Executive Vice President, Menzies Aviation

Julian Wann, Global Category Leader, Procurement Freight & Logistics, AstraZeneca

Olivier Simonnot, Senior Manager Strategic Marketing, Sensitech EMEA

Lothar Moehle, Director AVSEC & Governance, DB Schenker

IATA CARGO EVENTS

Amsterdam, Netherlands
29-31 October 2019

IATA

Joint Session

Air Pharma and Air Cargo Operations Presentation

Fabrice Panza

Cool Chain Project & GDP/QA Pharma Manager

Air France KLM Cargo

IATA CARGO EVENTS

Amsterdam, Netherlands
29-31 October 2019

IATA

Improve **TRANSPARENCY** and **EFFICIENCY**
in
the pharmaceutical air freight operations
through
INNOVATIVE and **DIGITAL** solutions

Panel discussion Amsterdam, IATA Air Pharma Conference, Oct 30th, Fabrice Panza

AGENDA

Transparency

Collaboration

Communication

Challenges

AIRFRANCE KLM
Martinair CARGO

Transparency : what kind of digital pharma services ?

Temp & Track: Keep track of your Pharma shipments temperature

Quote & Book: Quote and Book your Pharma online

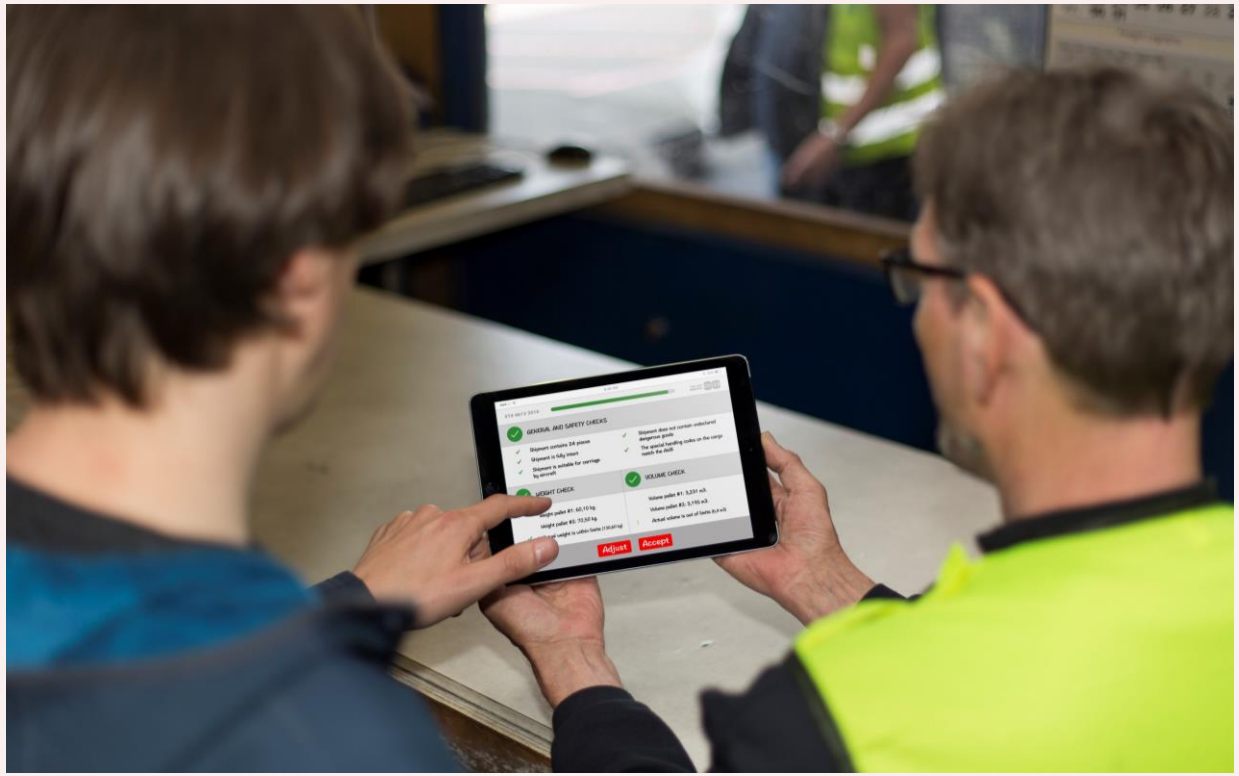
Station Capabilities Tool: Check and download all Pharma details station by station

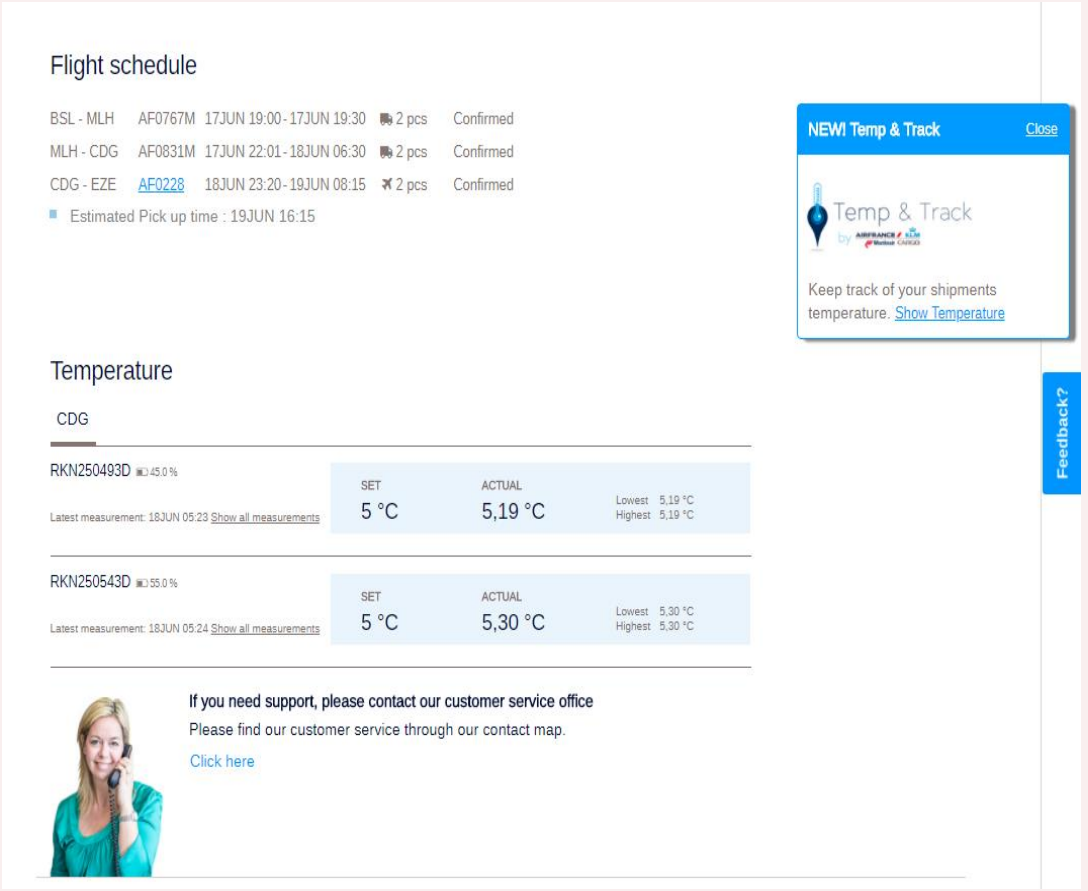
E-Pharma Acceptance : digital acceptance by means of digital tablet

E-CAPA : full online CAPA report and process

AIRFRANCE KLM
Martinair CARGO

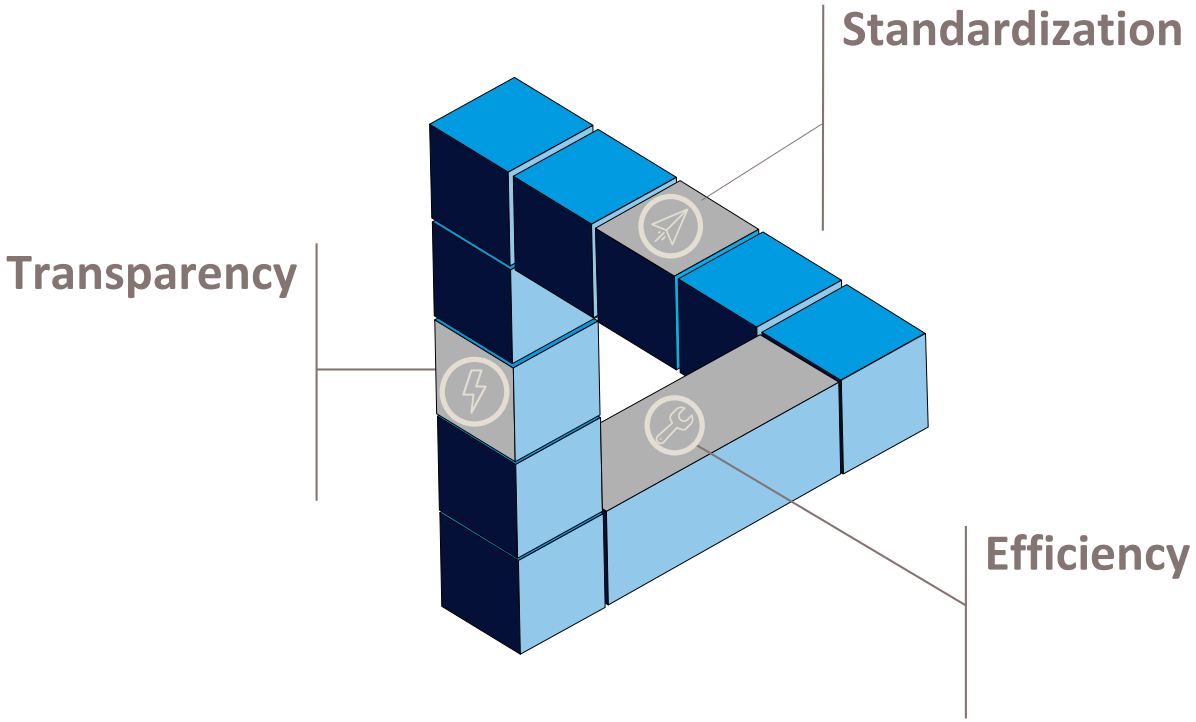
E- Pharma acceptance &TEMP & TRACK





Compliancy bringing lots of challenges…

IATA CEIV : What value does it bring ?



AIRFRANCE KLM
Martinair CARGO

…into innovative mode

11 audits in **6** months for **14** customers

1 audit with **5** customers at **1** time

(achieved in sep19 with collaborative PGA mindset)

Pre assessment online & on-site pre organized audits

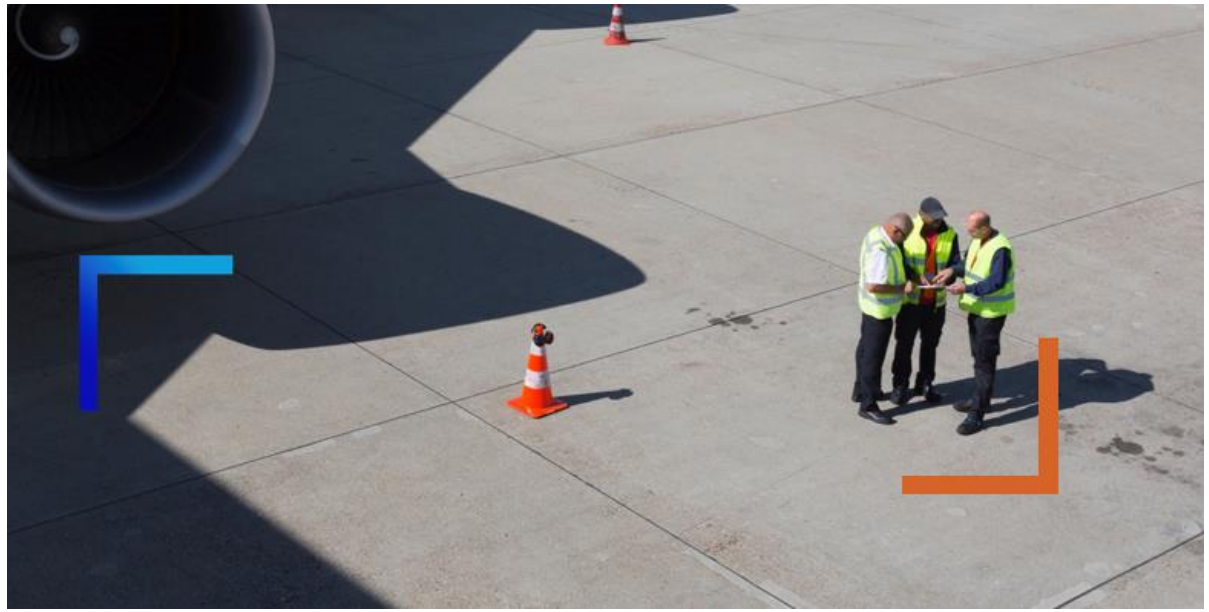
AGENDA

Transparency

Collaboration

Communication

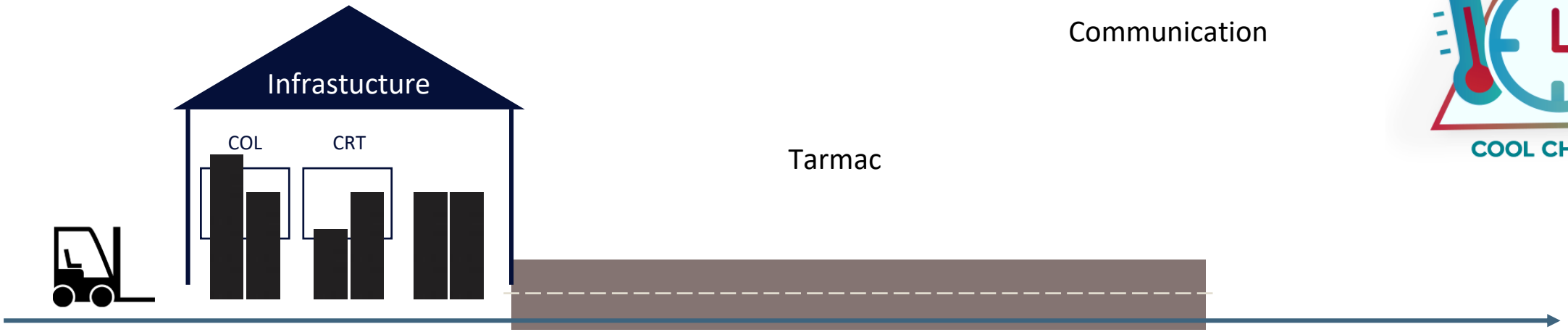
Challenges



AIRFRANCE KLM
Martinair CARGO

How enhancing internal & external collaboration ?

Cool Chain Program : 6 pillars + 1 global



Communication

Tarmac

Processes

Data & IT

Compliance

Monitoring

AGENDA

Transparency

Collaboration

Communication

Challenges

How communicating ?

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AGENDA

Transparency

Collaboration

Communication

Challenges

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What challenges do we face ?

- How IT can communicate through the full supply chain ?
- What kind of data ?
- What kind of tests ?

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Takeouts :

1. Set & entertain collaboration both internally and externally

2. Keep innovating and “POC” as much as possible

3. Keep Customer at center

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Fabrice Panza

GDP/QA Pharma Manager AFKL

Cool Chain Program Manager AF

Joint Session

Improving transparency and efficiency in the pharmaceutical air freight operations through innovative and digital solutions

Moderator: Bart Pouwels, Head of Cargo, Amsterdam Airport Schiphol

Panelists: Fabrice Panza, Cool Chain Project & GDP/QA Pharma Manager, AFKLM Cargo

Robert Fordree, Executive Vice President, Menzies Aviation

Julian Wann, Global Category Leader, Procurement Freight & Logistics, AstraZeneca

Olivier Simonnot, Senior Manager Strategic Marketing, Sensitech EMEA

Lothar Moehle, Director AVSEC & Governance, DB Schenker

IATA CARGO EVENTS

Amsterdam, Netherlands
29-31 October 2019

IATA

Chairman Closing Remarks

Maarten van As

Managing Director

Air Cargo Netherlands (ACN)

IATA AIRPHARMA CONFERENCE

Amsterdam, Netherlands

29-31 October 2019

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