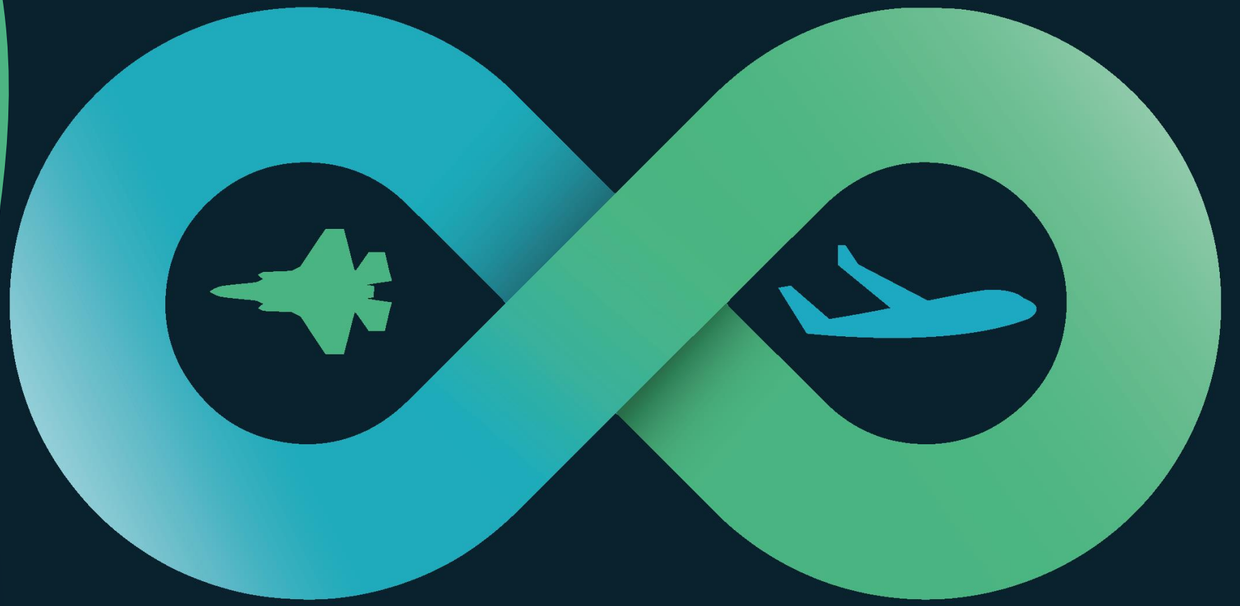
</ICT & LOGISTIEK>

Ministerie van Infrastructuur en Waterstaat

bdi

07th of November 2024

Driving sustainable maintenance through component chain control



HYPERION

KLM engineering & maintenance

Ministerie van Defensie

INNOTRACTOR ZERO WASTE SUPPLY CHAIN

ILIAS smart. reliable. ready.

nlr

OneLogistics

INNOTRACTOR

ZERO WASTE SUPPLY CHAIN

Zero waste supply chain

1 - CONNECTING SUPPLY CHAINS

2 - PROVIDE TRUSTED DATA EXCHANGE IN SUPPLY CHAINS

3- REMOVING WASTE IN SUPPLY CHAINS

Frank.Hermans@InnoTractor.com
www.InnoTractor.com

Demonstrator

Sneak Preview

1. Aircraft sensoring drives predictive maintenance

2. Control tower plans and optimizes spare parts handling and maintenance planning

3. Digitally controlled and maintenance supply chain management. All key components and sub-systems have a full digital life cycle log.

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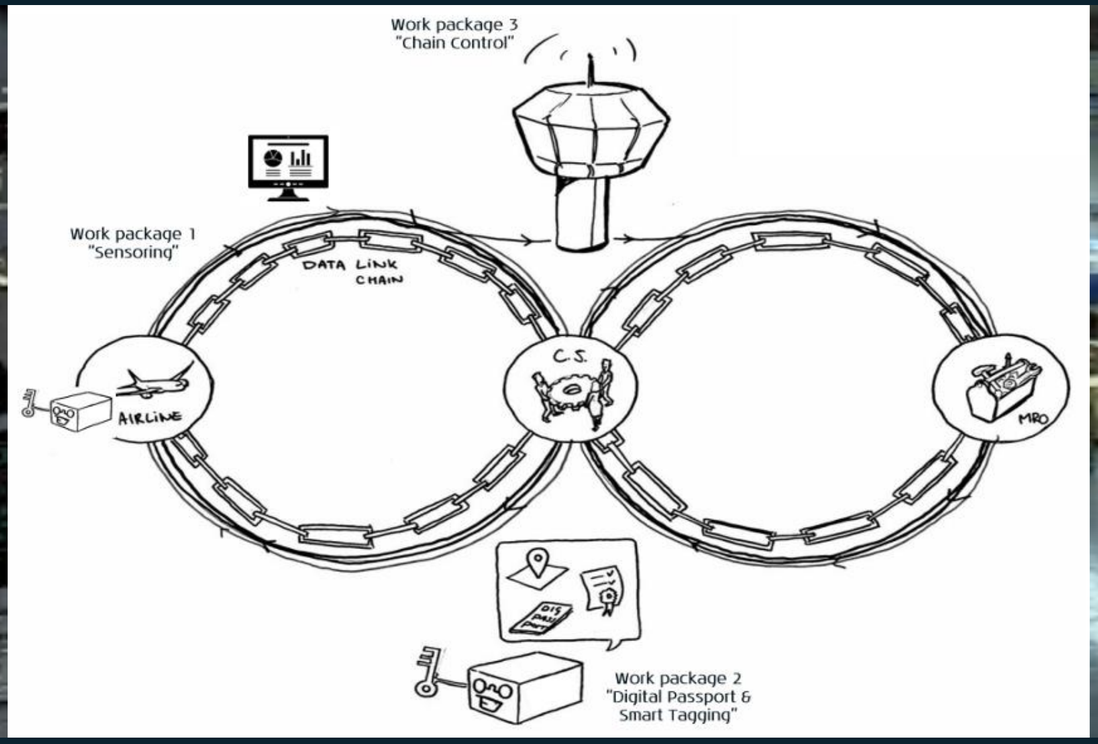
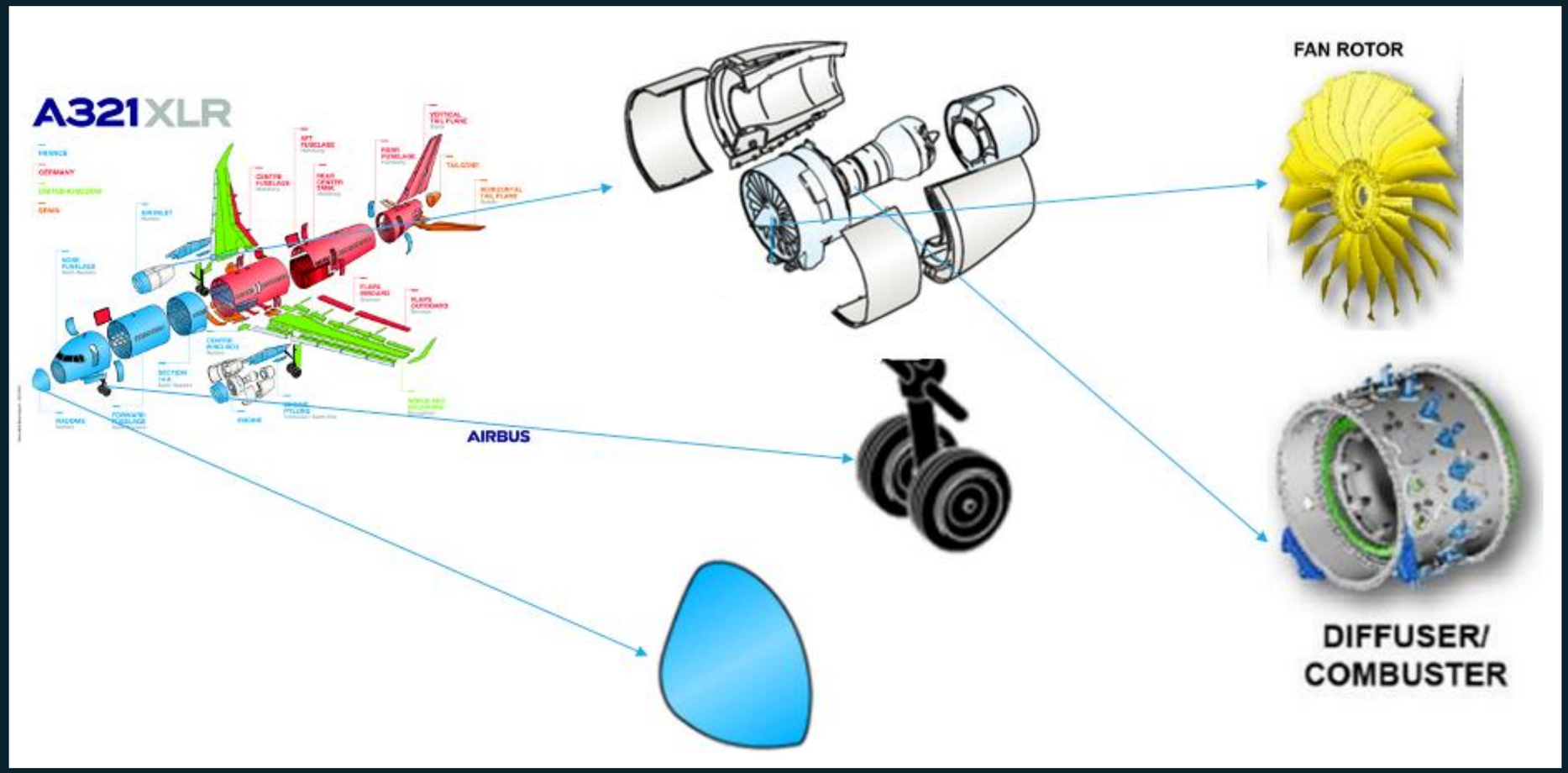


•Data driven aircraft maintenance

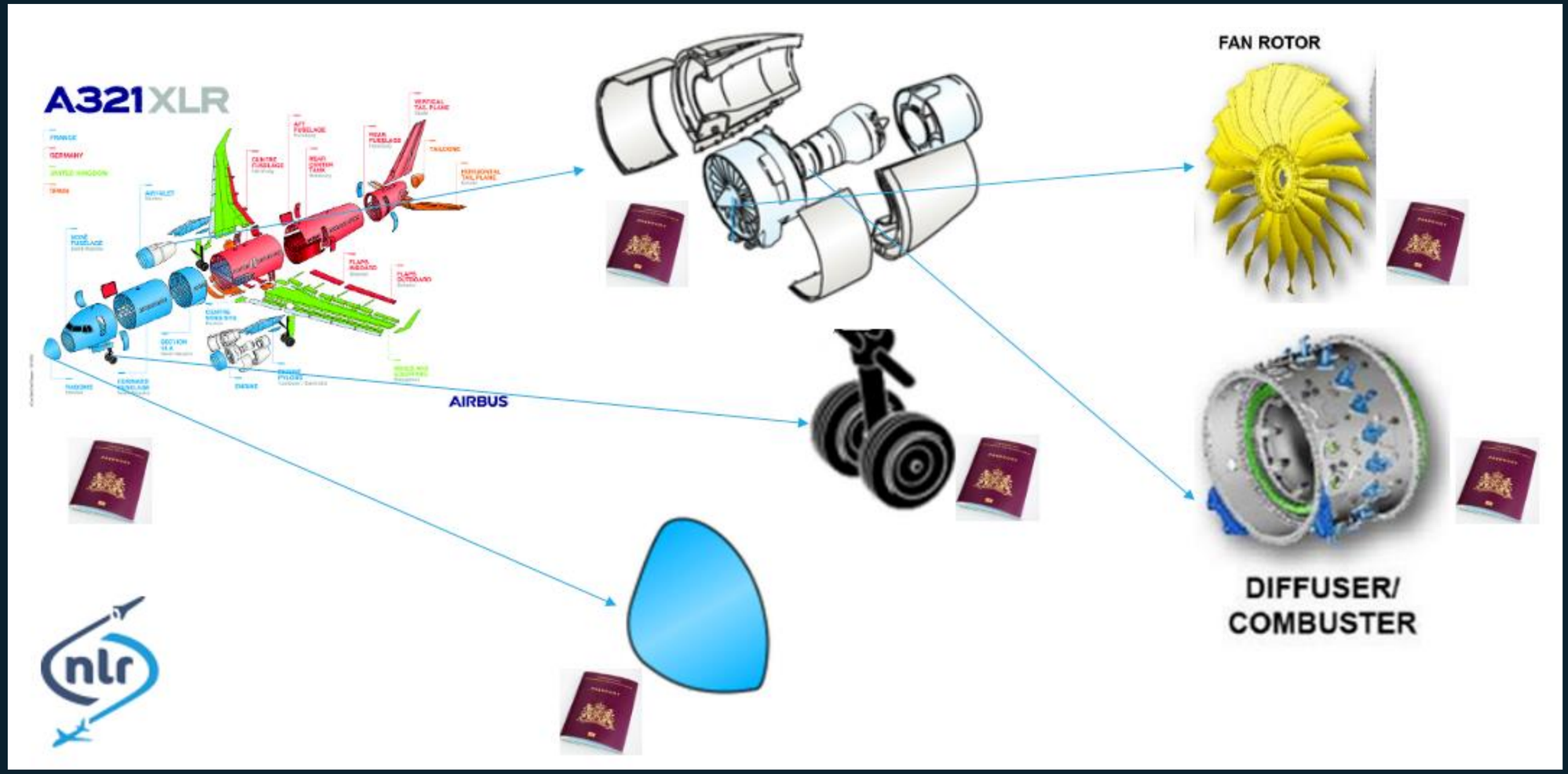
•Component Life cycle management

•Connected Supply Chain Control

Aircraft – Subsystems – Components, all with unique identifiers



Aircraft – Subsystems – Components,
all with unique identifiers and own Digital Product Passport



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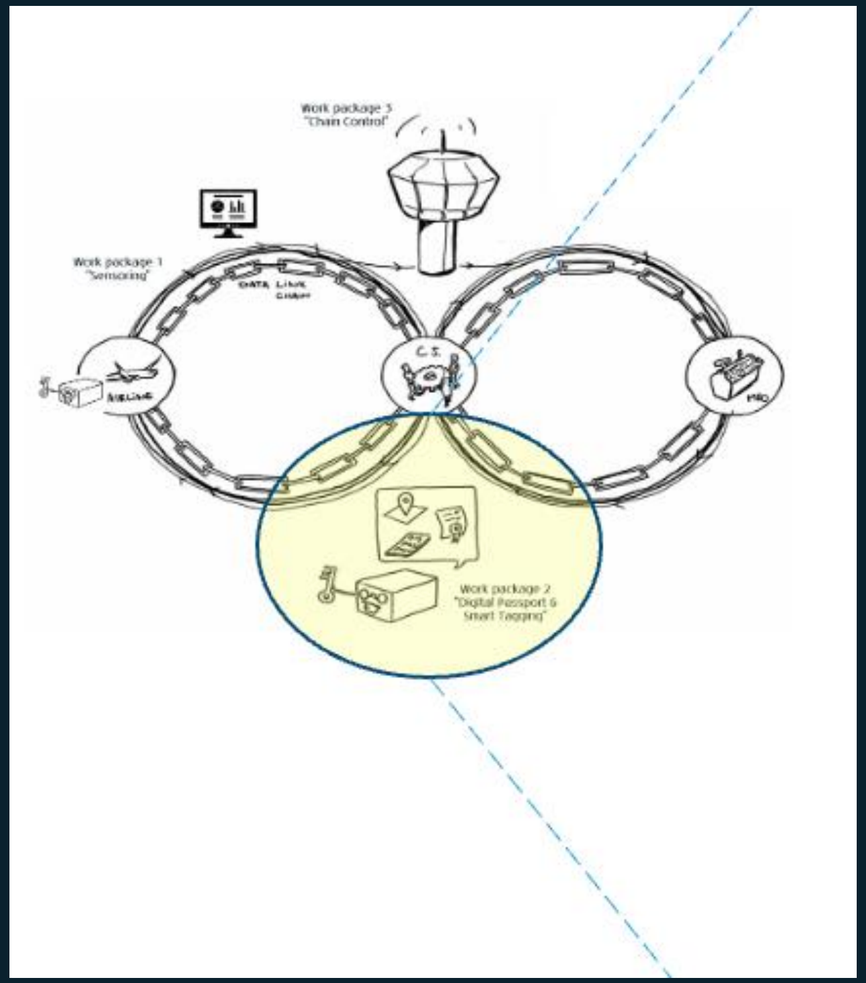
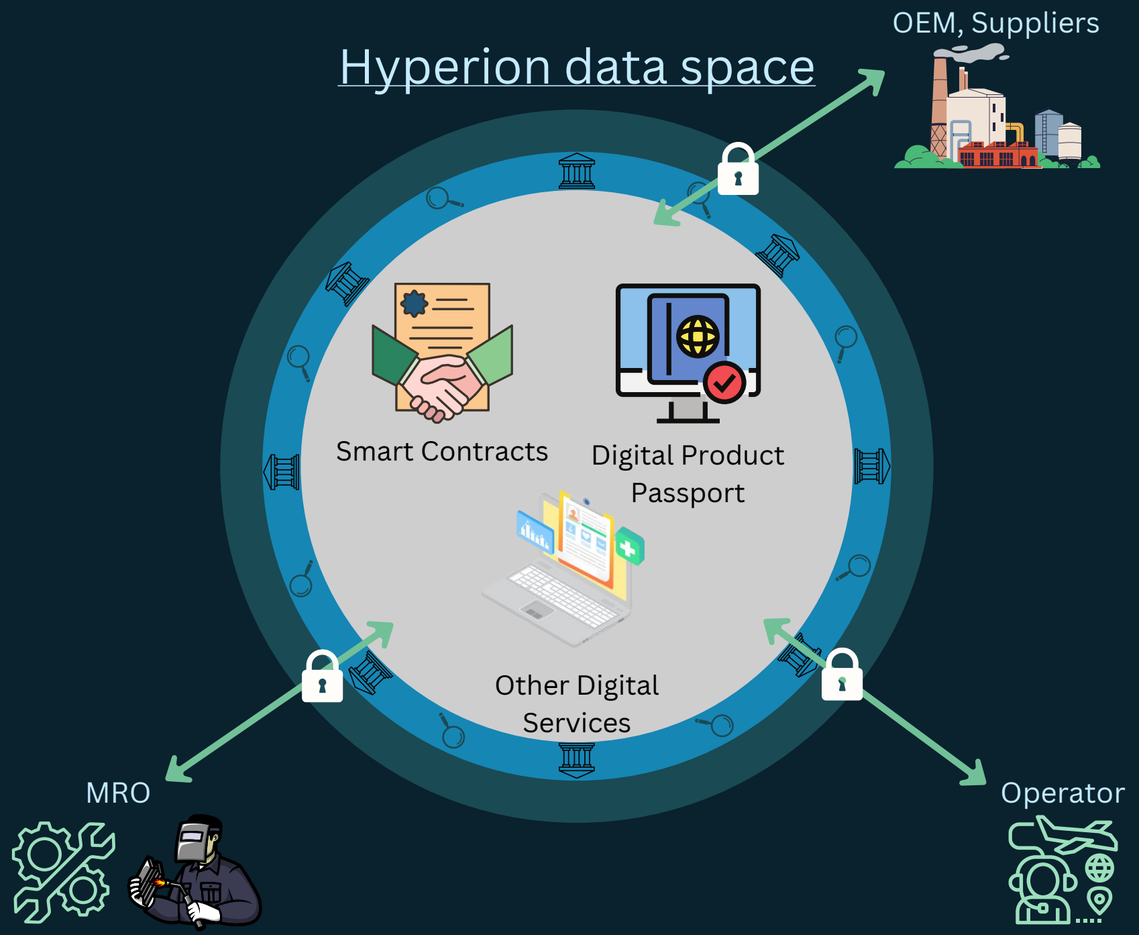


Hyperion data space



Data Sovereignty & Security

MRO receives work order for maintenance

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ZERO WASTE SUPPLY CHAIN

Operator | localhost:5001

devops | Taskboard | Other Bookmarks

HYPERION

Operator

Home

Owner ID

EU.EORI.NL000000000

EU.EORI.NL000000000

Component ID

Request Type

Required Date

dd / mm / yyyy , --:--

Submit

TODO: -2- Ready for service page with list and notifications.

MRO | localhost:5000

devops | Taskboard | Other Bookmarks

HYPERION

MRO

Service Requests

Subscriptions

Service Requests

Owner ID:

Search

TODO: -4- Planning request form.

Monitoring | Swagger UI | localhost:5002

devops | Taskboard | Other Bookmarks

HYPERION

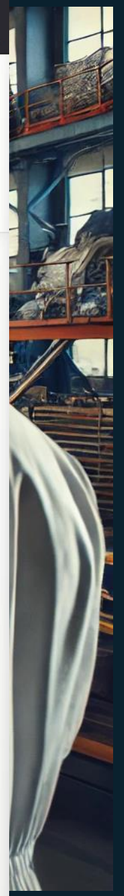
Monitoring

Notifications

Subscriptions

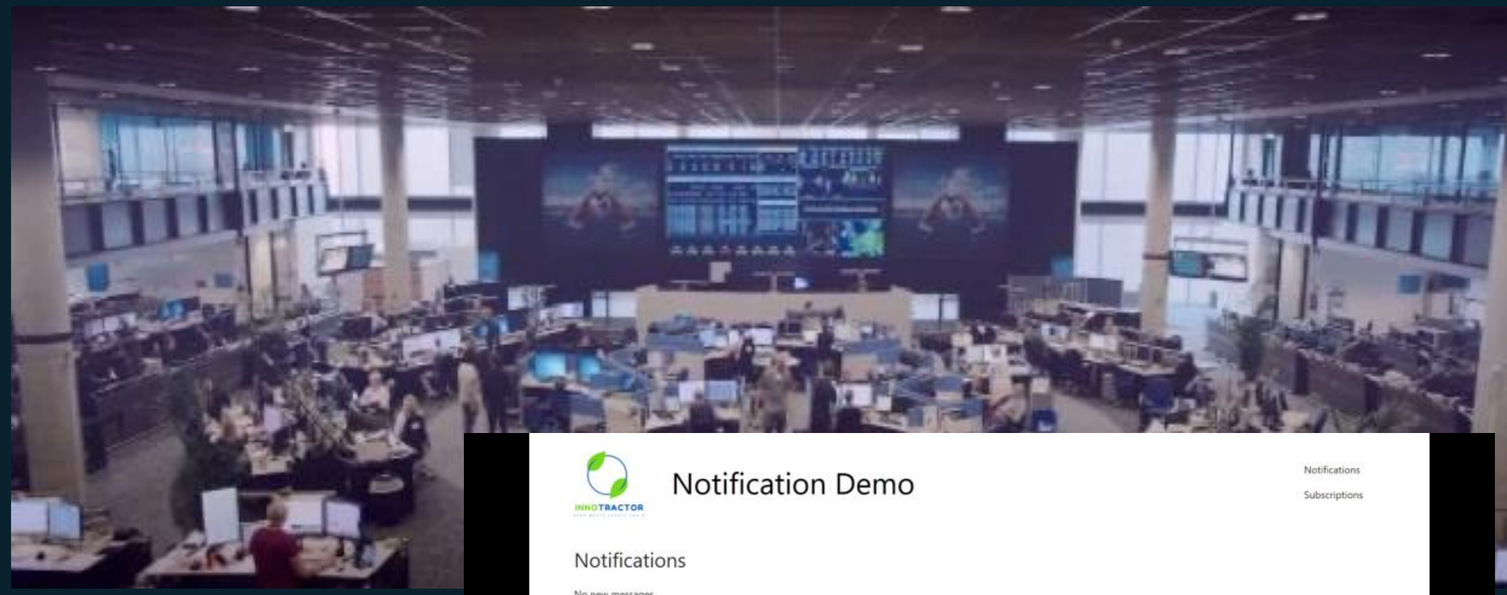
Notifications

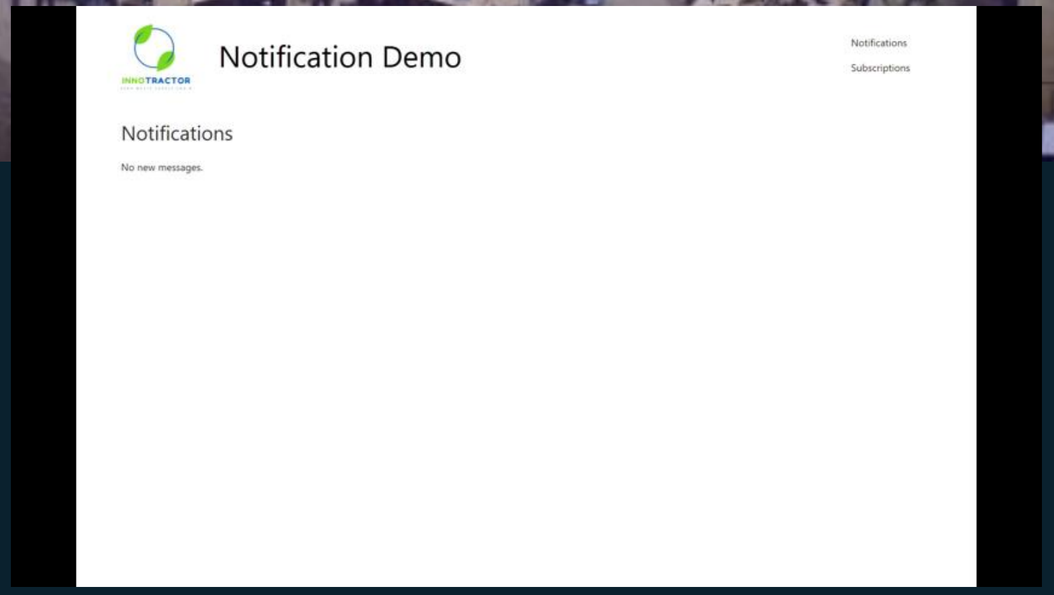
No new messages.

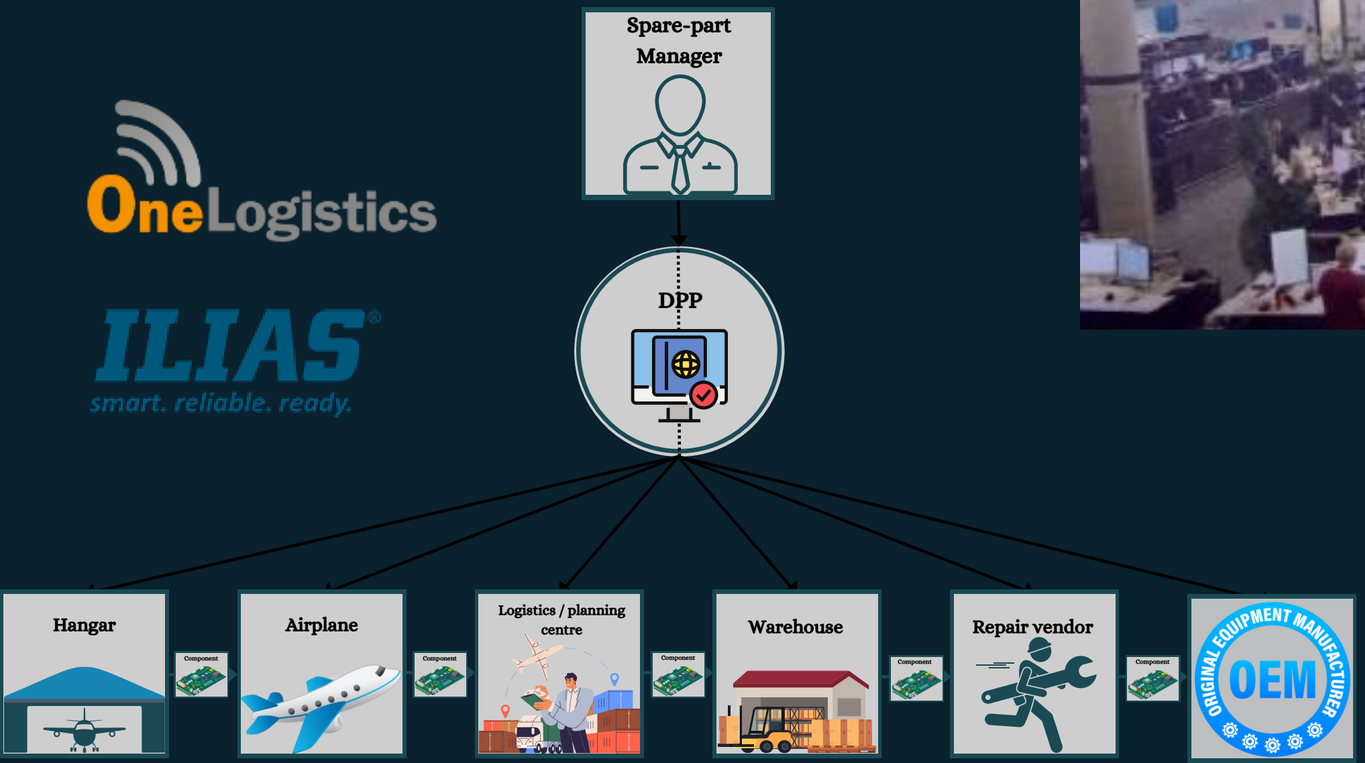


Control tower creates maintenance planning

- Spare-part manager uses DPPs to keep track of the locations of components and as such manage the MRO chain







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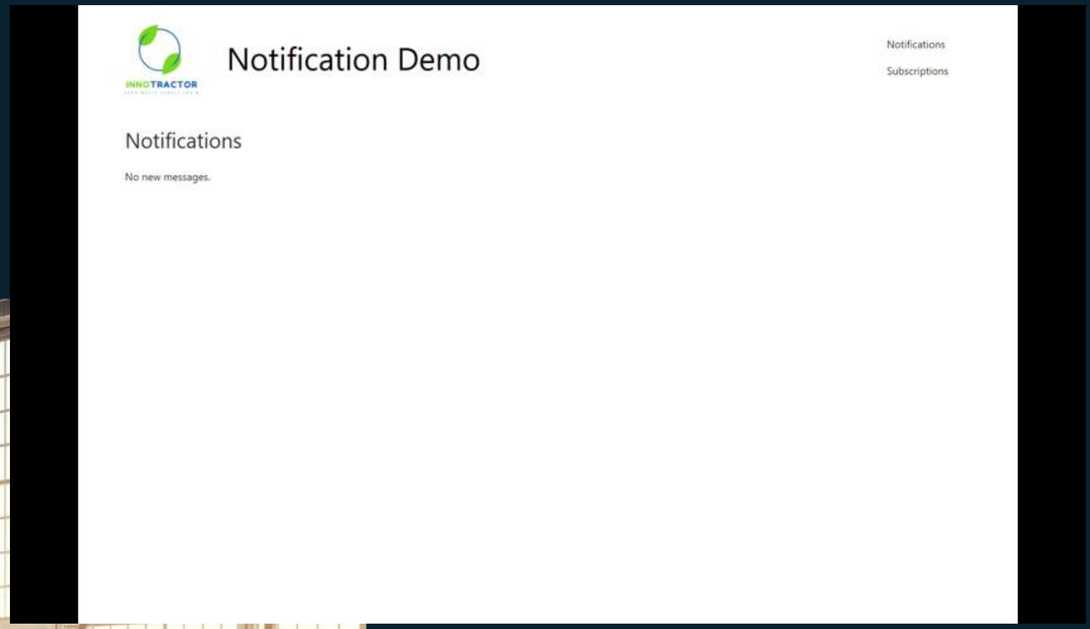
Aircraft back in service



Tracking & tracing, physically & digitally

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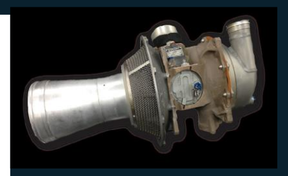
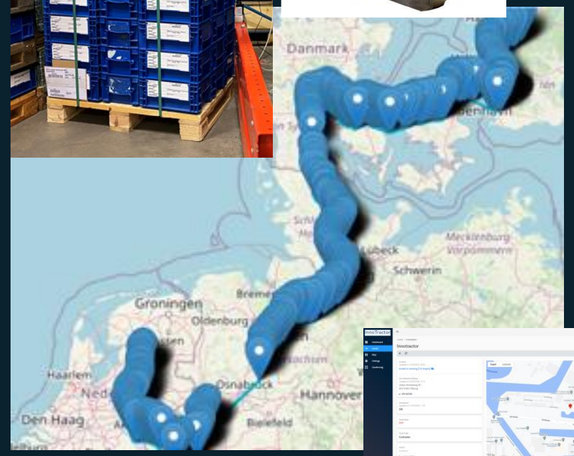
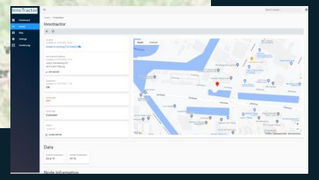






Tracking components

1

- **Request for maintenance**
- Smart contract triggers upon receiving a maintenance request, ensuring a verifiable and tamper-proof log.

2

- **Request for planning**
- Automatically initiates the necessary resources based on predefined conditions in the contract.

3

- **Planning execution**
- Ensures real-time tracking and tracing of events, components being transported and ensuring security and transparency from warehouse to repair shop

4

- **Ready for Service**
- Contract confirms completion and the asset is ready for service again where the contract is closed and auditable log stored.

Smart contracts

Product DPP categories:

Unique Product identifier
Name, type, description
Manufacturer and manf. date
Status:

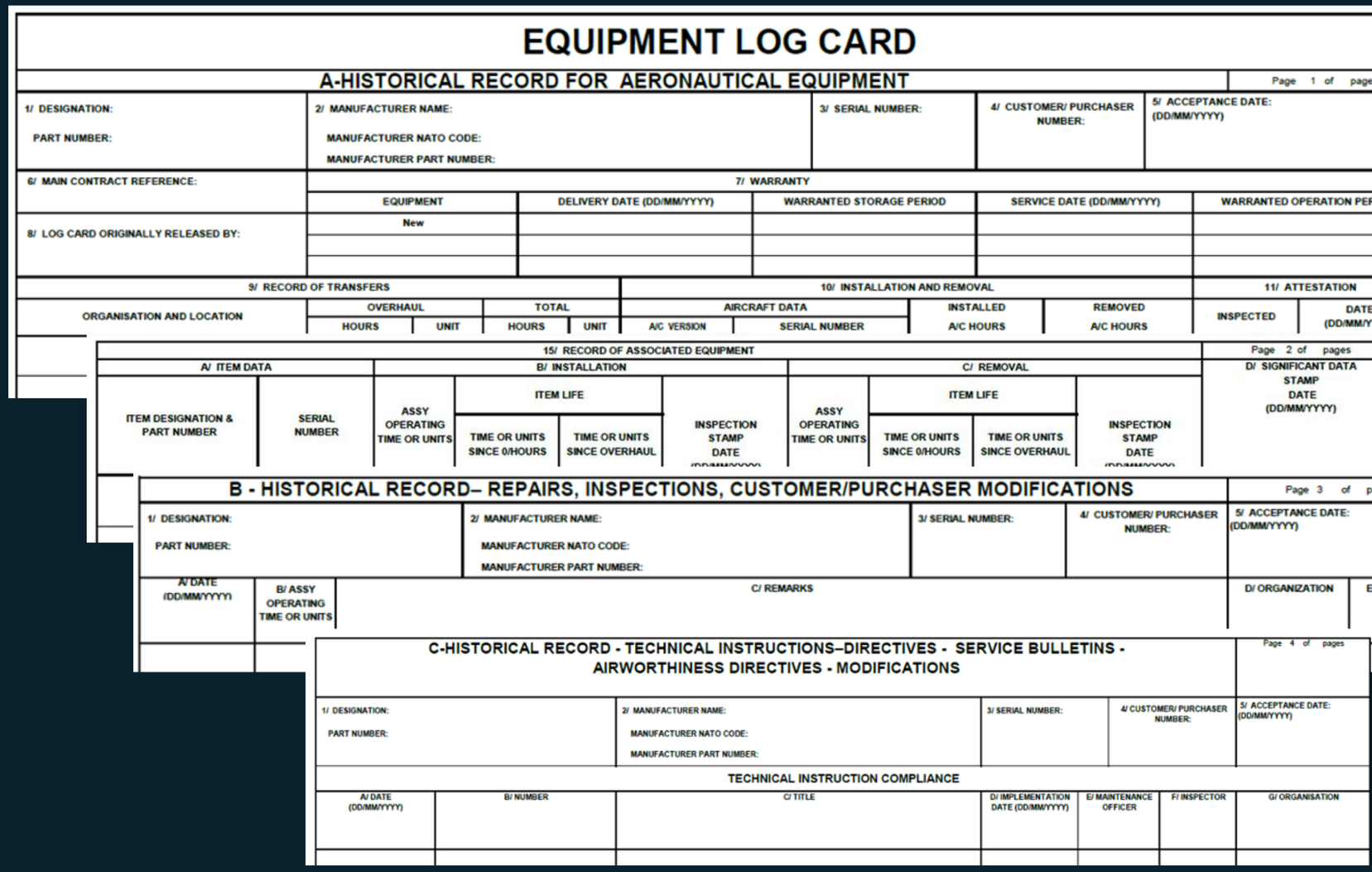
- Operational / in service / in supply
- Serviceable / unserviceable

Location: GPS, Name and/or location

- Depends on status and parent's location
- Optional link to parent
  Air worthiness information
- (Links to) certificates, etc.

History:

- Usage history:
  - Events during operation (which)
  - Links to sensor data (Origin)
- Maintenance history:
  - Events during maintenance
  - Links to maintenances logs, test results, etc.



EQUIPMENT LOG CARD

A-HISTORICAL RECORD FOR AERONAUTICAL EQUIPMENT

Page 1 of page

1/ DESIGNATION: PART NUMBER:	2/ MANUFACTURER NAME: MANUFACTURER NATO CODE: MANUFACTURER PART NUMBER:	3/ SERIAL NUMBER:	4/ CUSTOMER/ PURCHASER NUMBER:	5/ ACCEPTANCE DATE: (DD/MM/YYYY)

6/ MAIN CONTRACT REFERENCE:	7/ WARRANTY				
	EQUIPMENT	DELIVERY DATE (DD/MM/YYYY)	WARRANTED STORAGE PERIOD	SERVICE DATE (DD/MM/YYYY)	WARRANTED OPERATION PER
8/ LOG CARD ORIGINALLY RELEASED BY:	New				

9/ RECORD OF TRANSFERS					10/ INSTALLATION AND REMOVAL				11/ ATTESTATION	
ORGANISATION AND LOCATION	OVERHAUL		TOTAL		AIRCRAFT DATA		INSTALLED	REMOVED	INSPECTED	DATE (DD/MM/Y
	HOURS	UNIT	HOURS	UNIT	A/C VERSION	SERIAL NUMBER	A/C HOURS	A/C HOURS		

15/ RECORD OF ASSOCIATED EQUIPMENT

Page 2 of pages

A/ ITEM DATA		B/ INSTALLATION			C/ REMOVAL			D/ SIGNIFICANT DATA STAMP DATE (DD/MM/YYYY)
ITEM DESIGNATION & PART NUMBER	SERIAL NUMBER	ASSY OPERATING TIME OR UNITS	ITEM LIFE: TIME OR UNITS SINCE 0/HOURS	ITEM LIFE: TIME OR UNITS SINCE OVERHAUL	INSPECTION STAMP DATE	ASSY OPERATING TIME OR UNITS	ITEM LIFE: TIME OR UNITS SINCE 0/HOURS	ITEM LIFE: TIME OR UNITS SINCE OVERHAUL	INSPECTION STAMP DATE

B - HISTORICAL RECORD– REPAIRS, INSPECTIONS, CUSTOMER/PURCHASER MODIFICATIONS

Page 3 of p

1/ DESIGNATION: PART NUMBER:	2/ MANUFACTURER NAME: MANUFACTURER NATO CODE: MANUFACTURER PART NUMBER:	3/ SERIAL NUMBER:	4/ CUSTOMER/ PURCHASER NUMBER:	5/ ACCEPTANCE DATE: (DD/MM/YYYY)

A/ DATE (DD/MM/YYYY)	B/ ASSY OPERATING TIME OR UNITS	C/ REMARKS	D/ ORGANIZATION	E

C-HISTORICAL RECORD - TECHNICAL INSTRUCTIONS–DIRECTIVES - SERVICE BULLETINS - AIRWORTHINESS DIRECTIVES - MODIFICATIONS

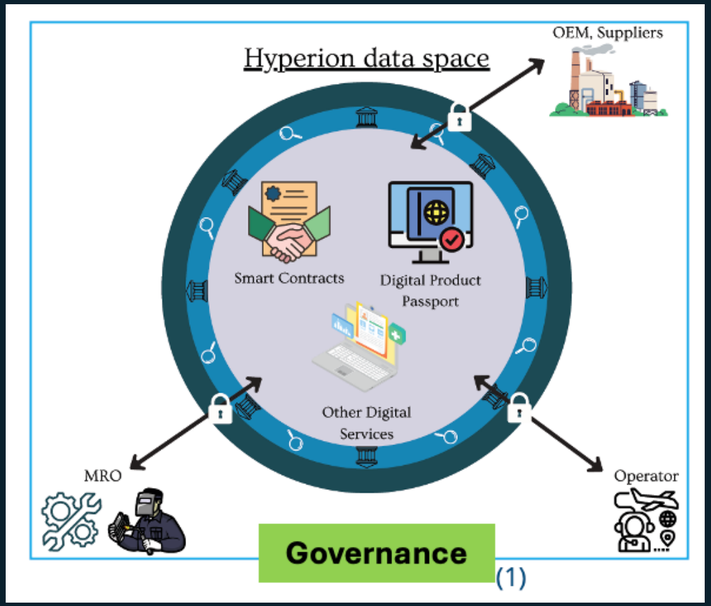
Page 4 of pages

1/ DESIGNATION: PART NUMBER:	2/ MANUFACTURER NAME: MANUFACTURER NATO CODE: MANUFACTURER PART NUMBER:	3/ SERIAL NUMBER:	4/ CUSTOMER/ PURCHASER NUMBER:	5/ ACCEPTANCE DATE: (DD/MM/YYYY)

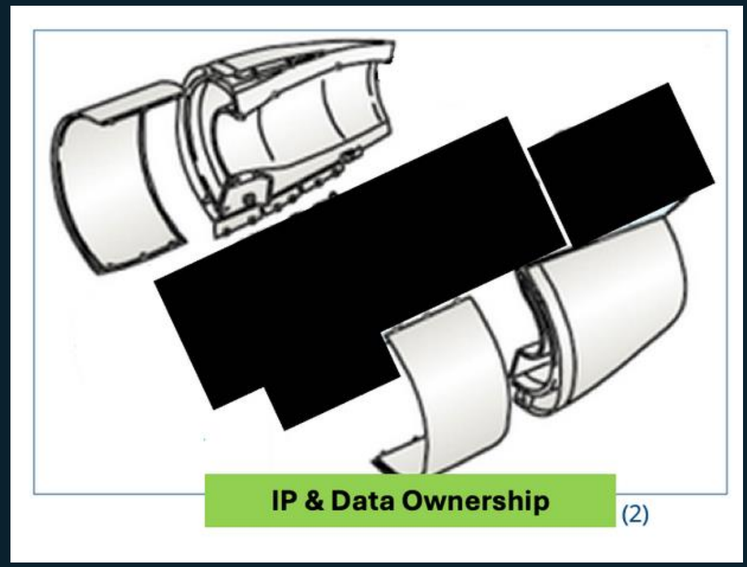
TECHNICAL INSTRUCTION COMPLIANCE

A/ DATE (DD/MM/YYYY)	B/ NUMBER	C/ TITLE	D/ IMPLEMENTATION DATE (DD/MM/YYYY)	E/ MAINTENANCE OFFICER	F/ INSPECTOR	G/ ORGANISATION

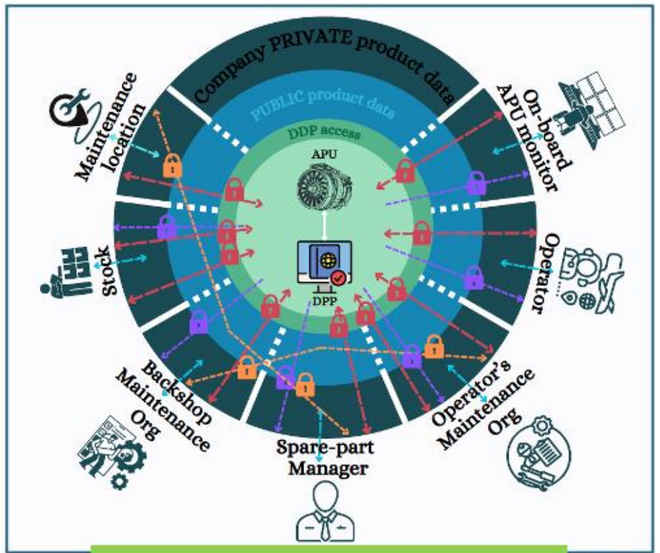
Caveat: DPP contents also defined by current practices, regulations, standards, etc.



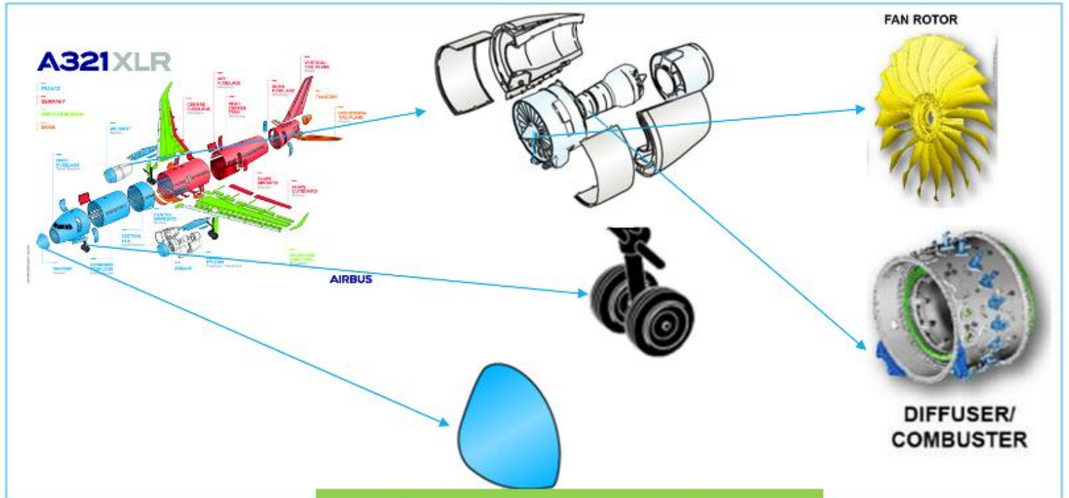
Governance (1)



IP & Data Ownership (2)



Simplification (4)



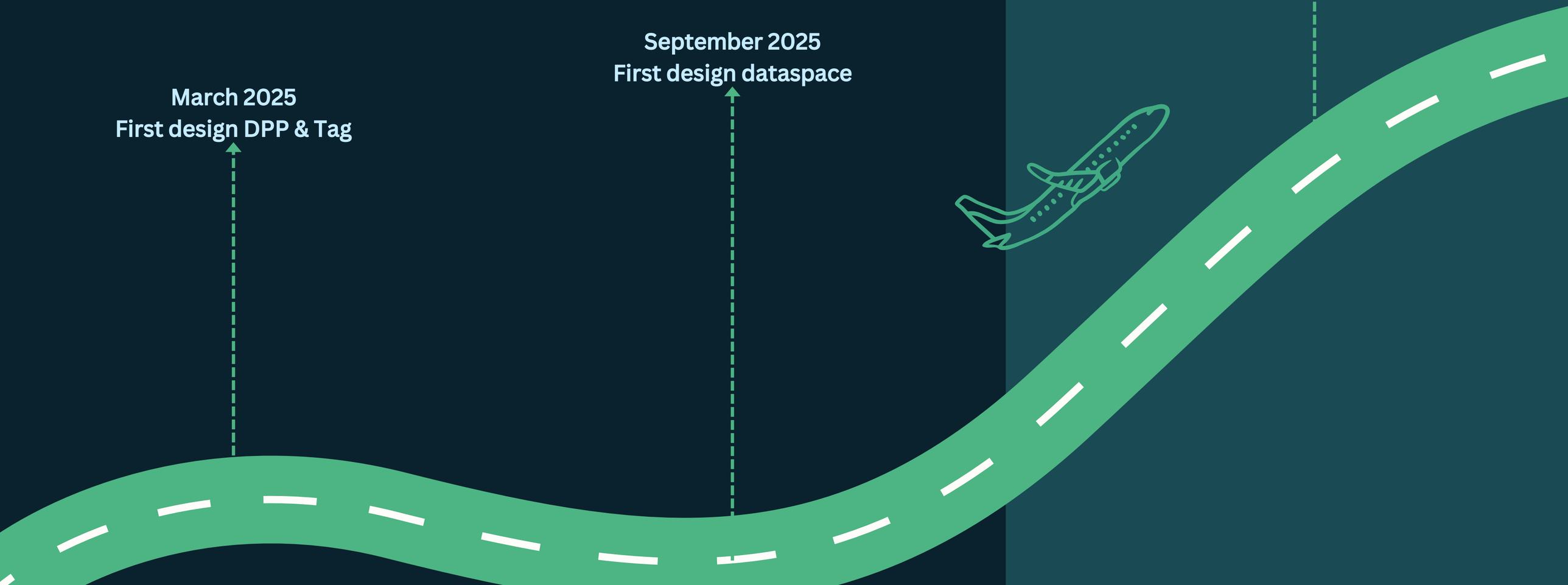
DPP standardisation (3)

Roadmap

March 2025
First design DPP & Tag

September 2025
First design dataspace

October 2025
Demonstrator V0.1

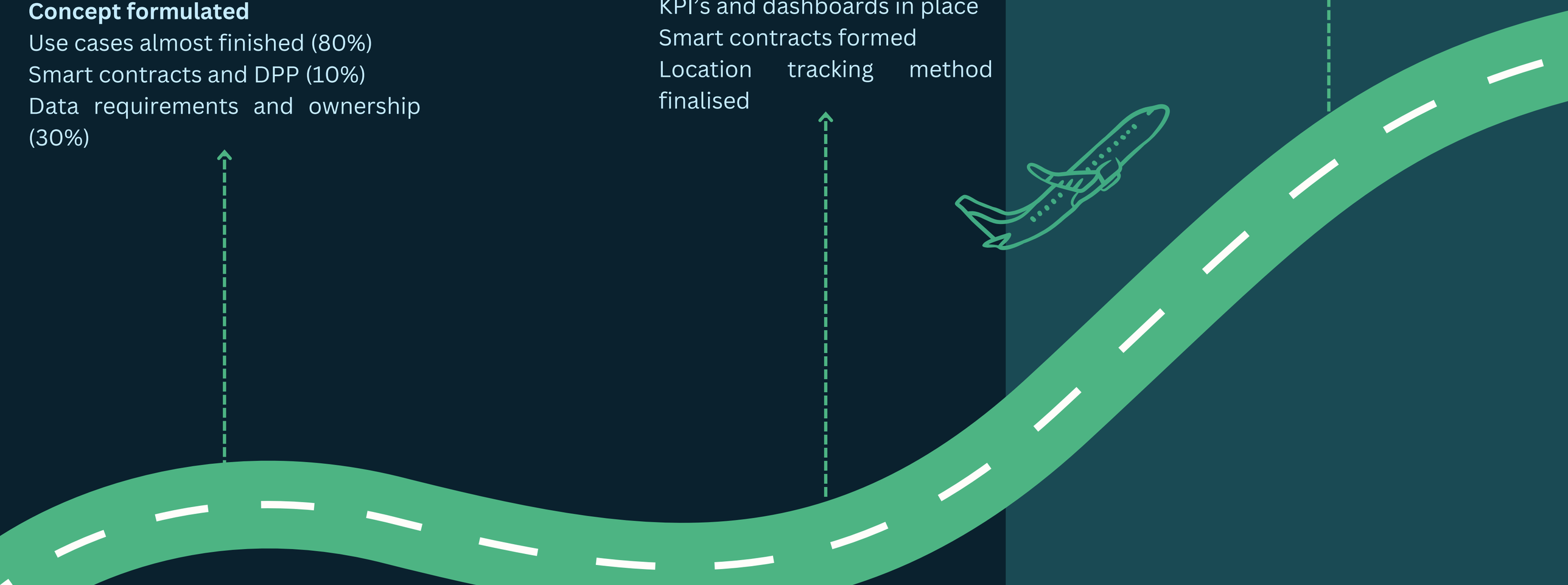


Roadmap

Concept formulated
Use cases almost finished (80%)
Smart contracts and DPP (10%)
Data requirements and ownership (30%)

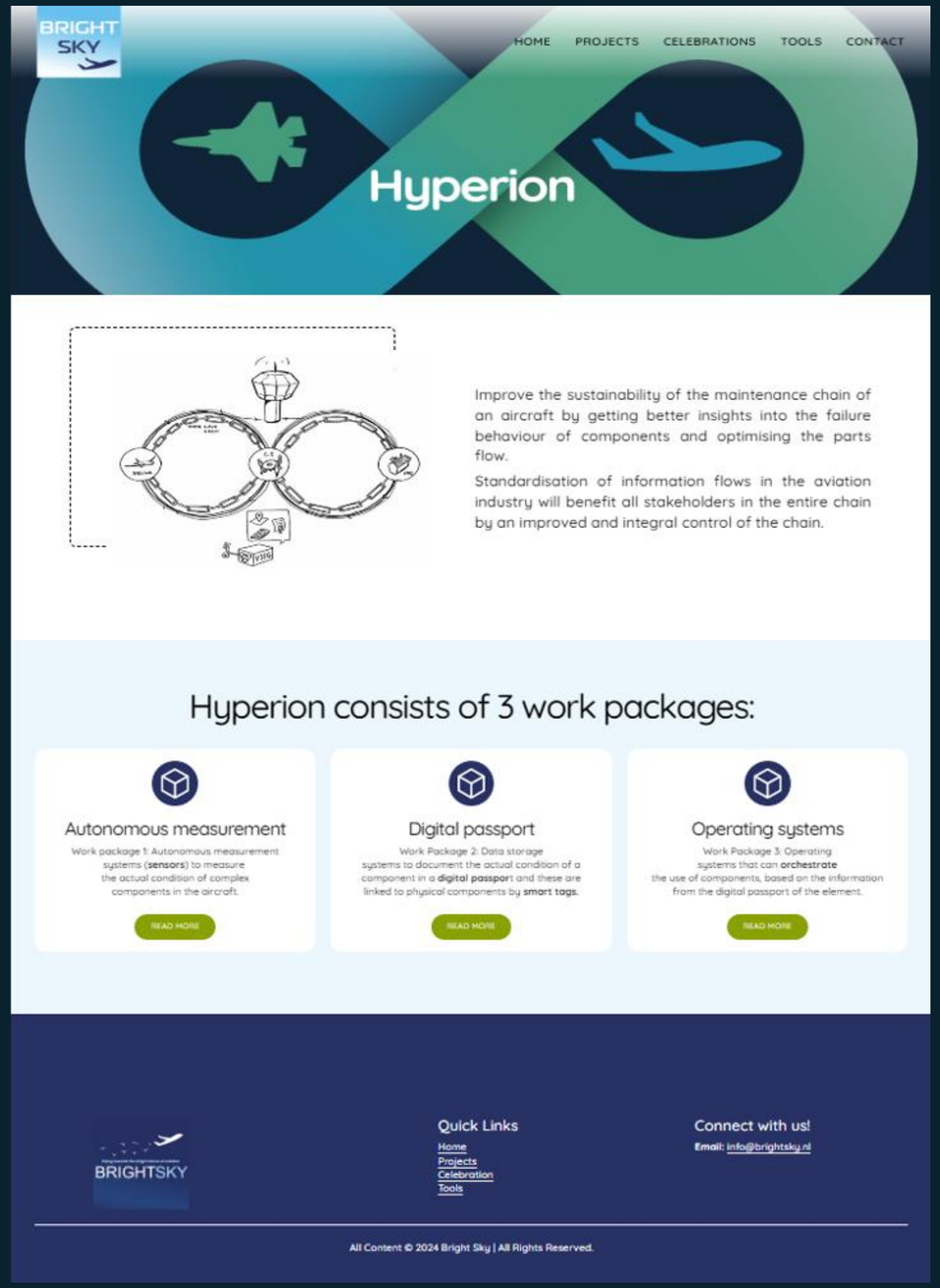
Technology validated in a lab environment
ERP configured
KPI’s and dashboards in place
Smart contracts formed
Location tracking method finalised

TRL 7 System prototype demonstration in operational environment
Functional Control Tower, integrated with WP1 and WP2 results.
Proof of improvement potential



Communication

- HYPERION website; brightsky.nl/hyperion-project
- LinkedIn account; brightsky.nl
- Aviation Week; interviews



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Questions?

Thank you!

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