

VIRTUA Project - Blockchain for airworthiness in aviation

Developing Solutions and Strategies for Integrating Blockchain in Airworthiness Management

January 2024

Workshop Speakers



Iñigo ARSUAGA
FPT SOFTWARE

Digital Transformation & Aviation

inigoae@fpt.com



Mayeul DUPUY
PwC France

Blockchain Expert

mayeul.dupuy@pwc.com

Attendants

Airworthiness and Maintenance Specialists | Aviation Executives and decision-makers
Regulatory and Compliance Officers | Lessors | Aviation Blockchain Developers

Workshop guidelines



Video recording & Transcript

The event is going to be recorded in video.

It will be available in the future through the EASA website.

The attendees will be kept anonymous unless they participate on the Q&A section.



Polls

During the workshop, some polls will be shared to you.

They will appear directly on your screen, and can also be seen in the « Polls » tab.

We invite you to respond to them to share your opinion and expertise.



Questions & answers

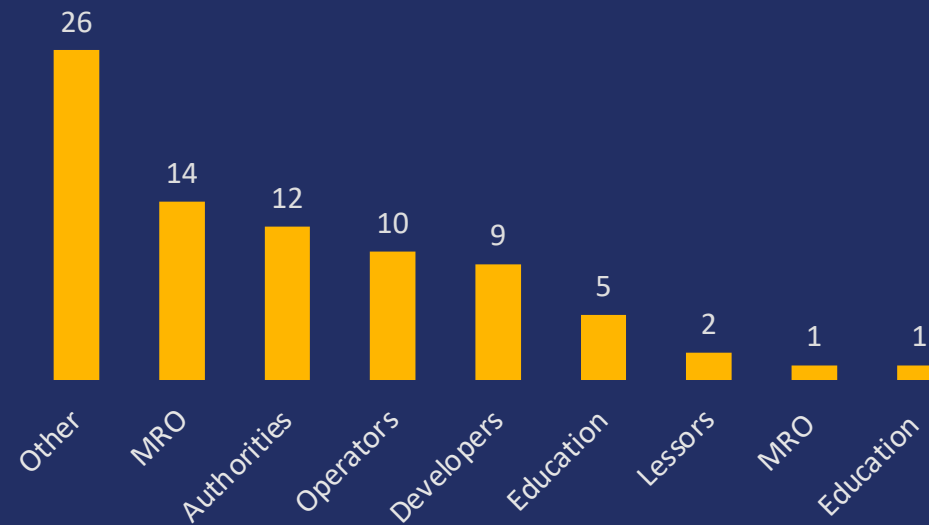
You can ask your questions directly in the « Q&A » tab of Teams.

We will do our best to respond orally or in writing.

You can also respond to other participants.

Poll #1:

Which Stakeholder group are you representing today?

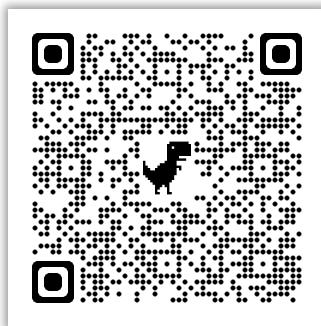


VIRTUA project scope

- Use of the blockchain technologies for the management of aircraft parts throughout their lifecycle
- Some challenges we see today:
 - Parts traceability
 - SUPs and fraudulent certificates/EASA F1s
- What do we expect from this project:
 - Assessment of benefits and constrains using the blockchain technology
 - Recommendations for changes to be introduced in regulations, standards and working processes

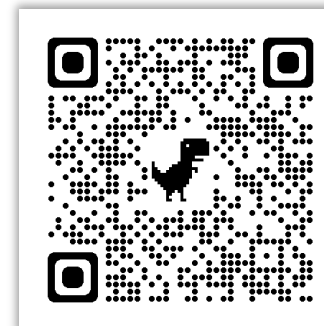
More information:

EASA



<https://www.easa.europa.eu/en/research-projects/virtua-digital-transformation-case-studies-aviation-safety-standards>

LinkedIn group

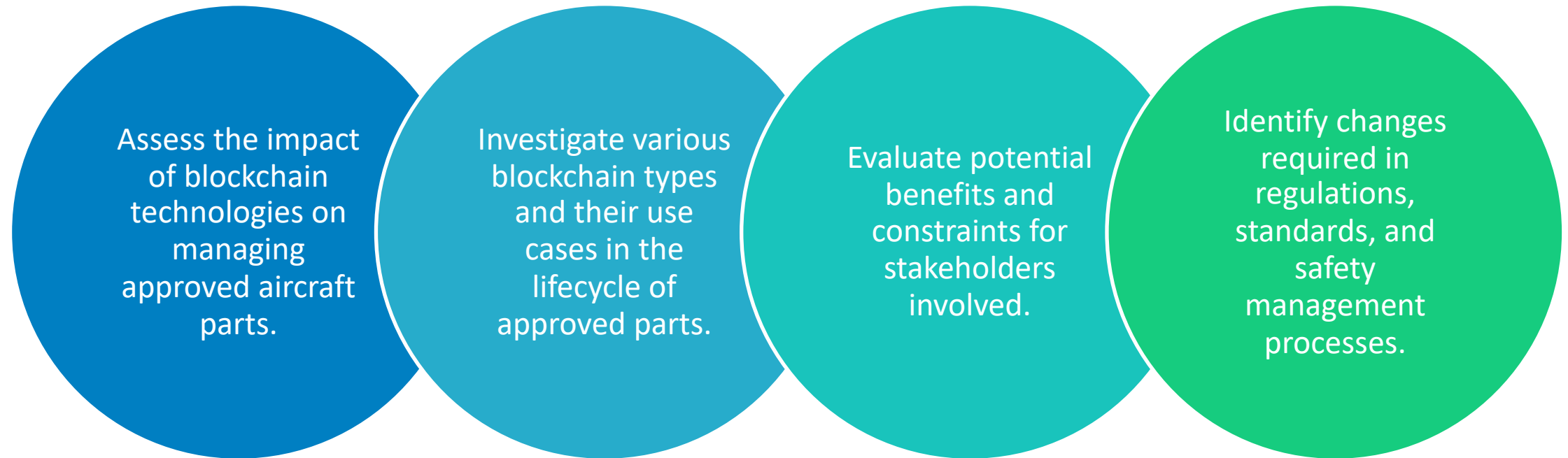


Blockchain for aircraft parts -
Horizons Europe EASA

VIRTUA project partners



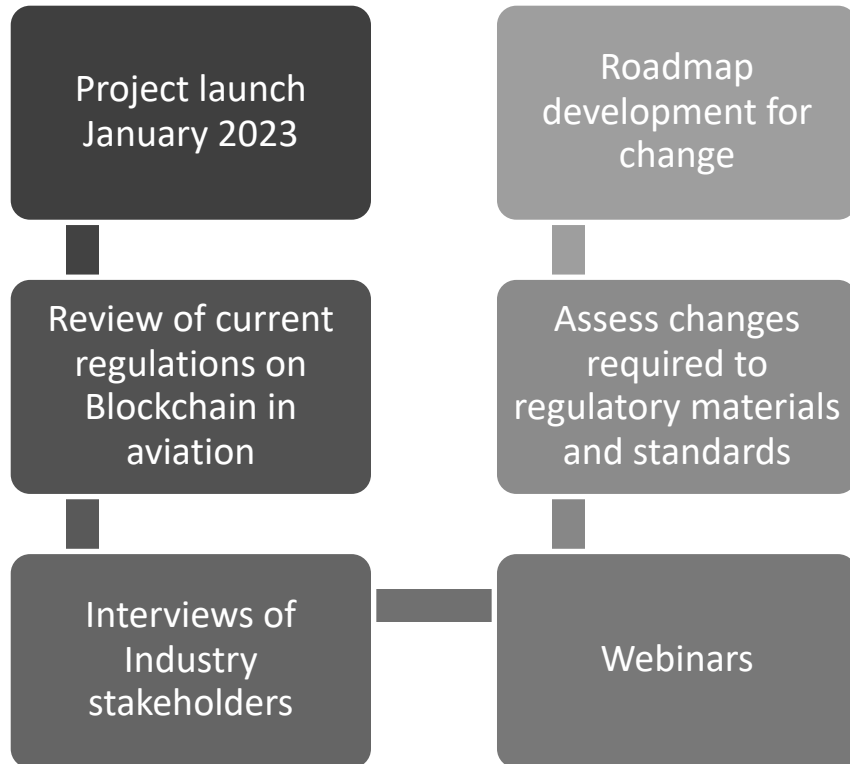
The VIRTUA Project objectives



Workshop #2 – Identifying opportunities



The VIRTUA Project advancement and deliverables



Current stage:

Currently we are in information gathering stage, where we want to get the complete views from aviation stakeholders. If you would like to **collaborate**, and your view to be heard we would be glad to conduct an in depth interview.

Specially, if you are from one of these stakeholders' groups:

OPERATORS

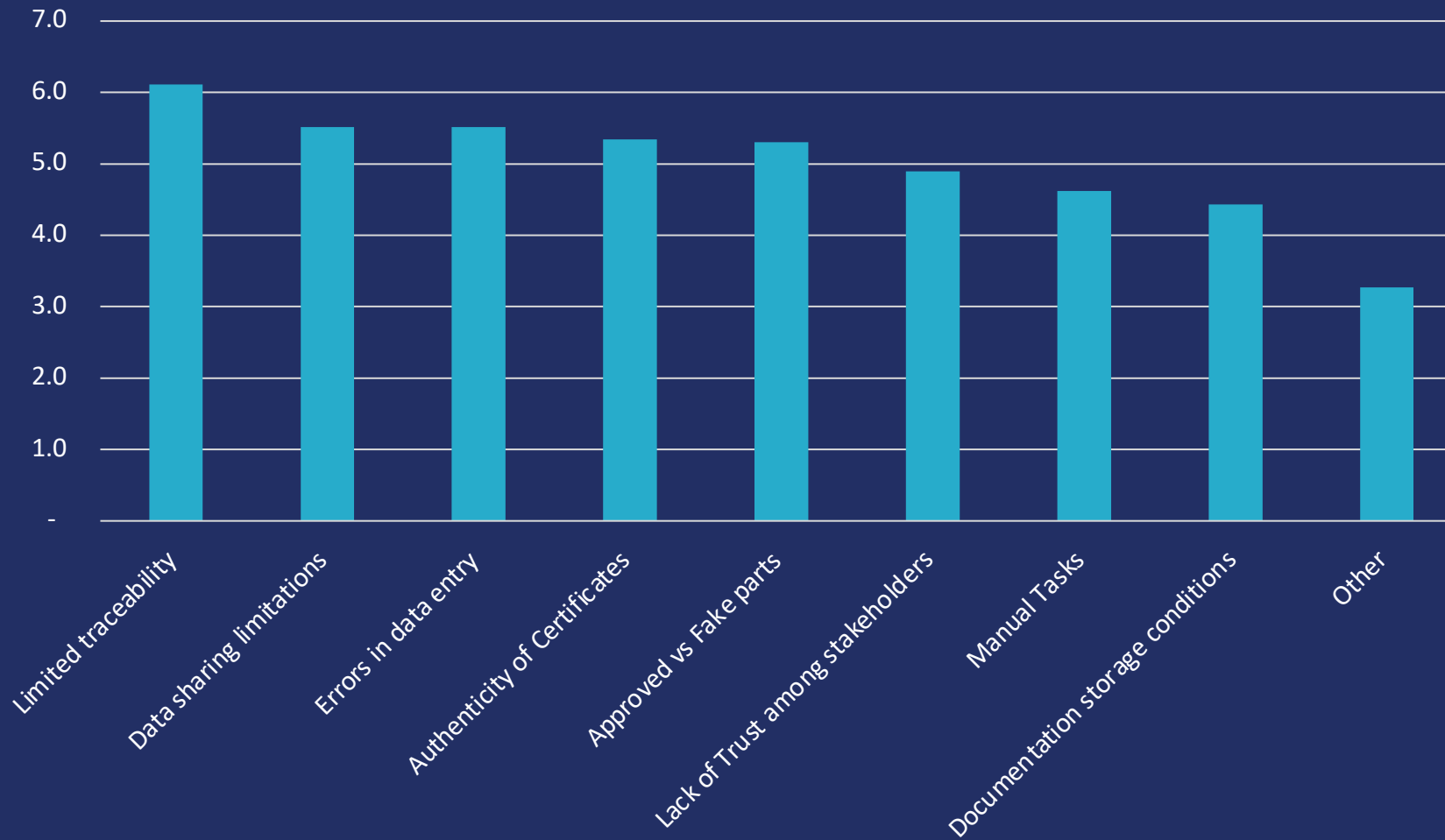
LESSORS

OEMs

Previous workshop polls and results

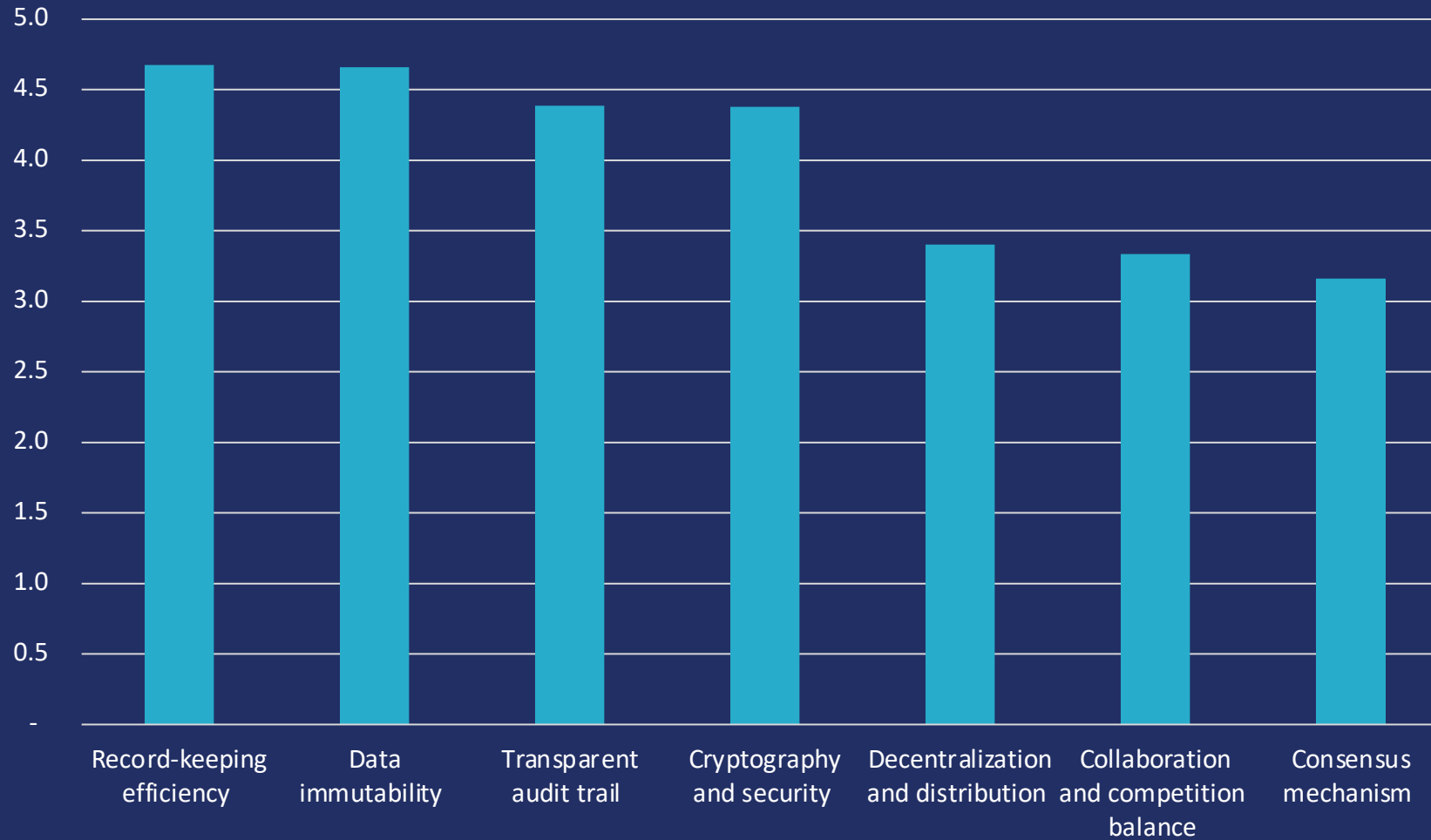
What do you consider to be the most significant challenges in airworthiness parts tracking?

Average score
on a 9 to 1 scale



What are the essential blockchain concepts that should be prioritized for implementation in the aviation sector?

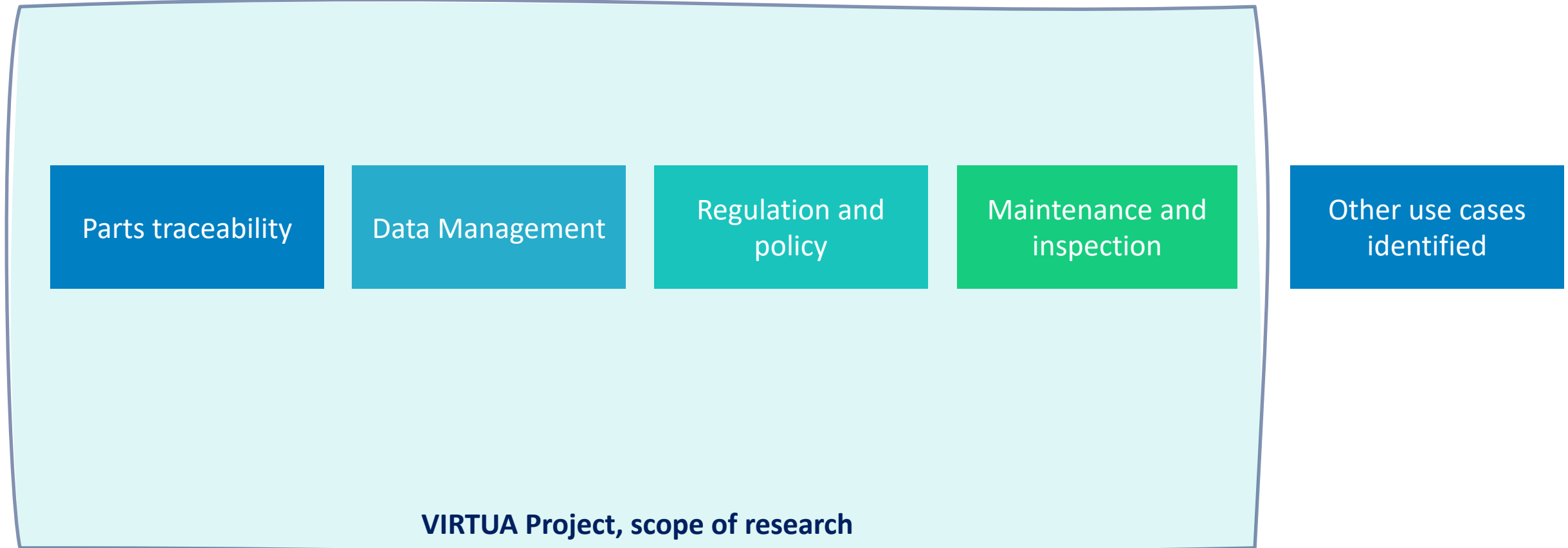
Average score
on a 7 to 1 scale



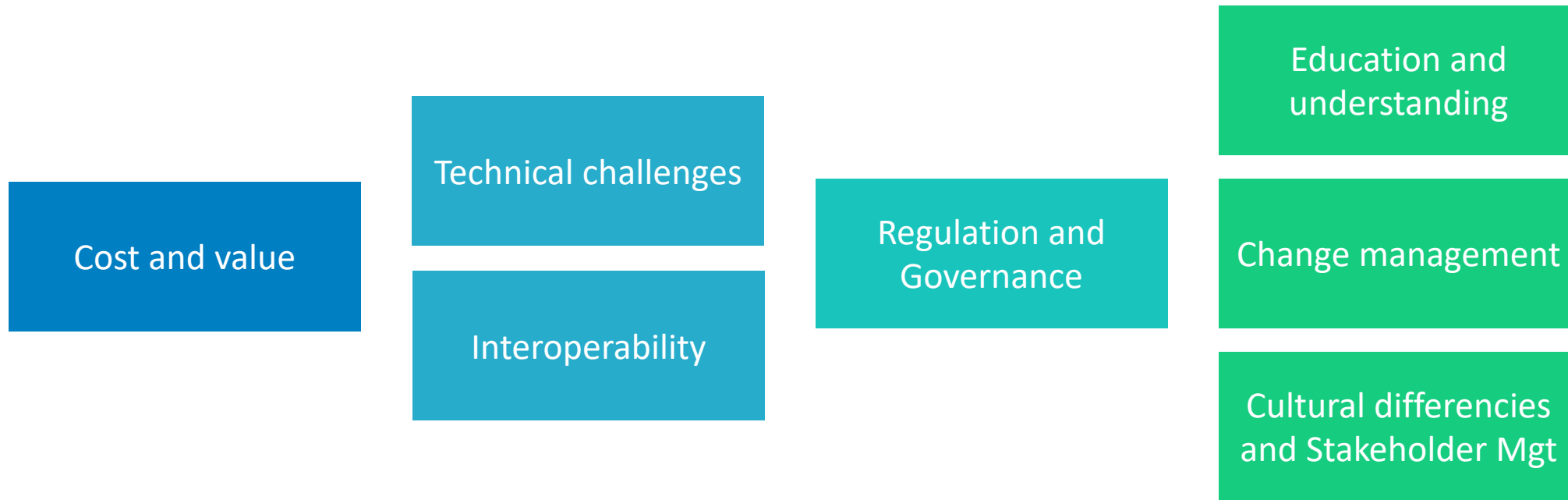


Insights from interviews

Key blockchain-based use cases identified by stakeholders in the industry



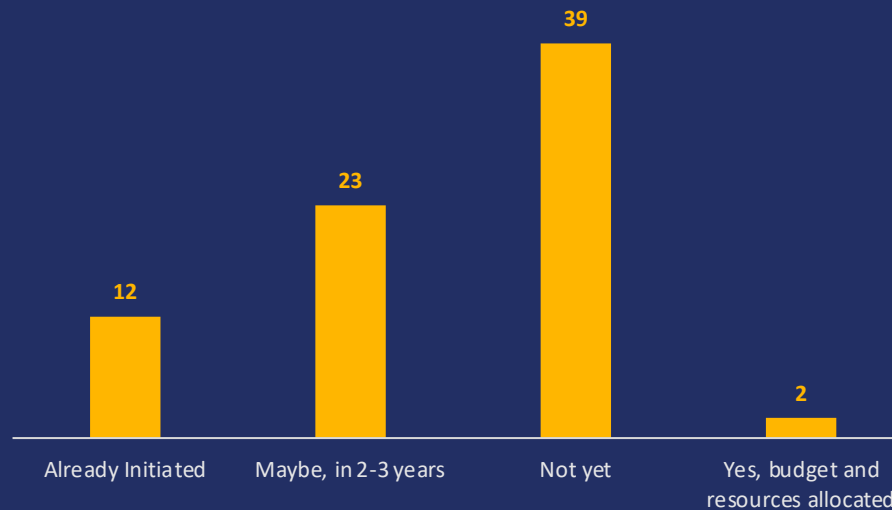
Despite recognizing Blockchain's potential, the aeronautics industry faces challenges in its implementation



The industry is open to change and there is optimism that Blockchain could coexist with current solutions, eventually becoming fully digital if proven effective.

Poll #2:

Have you considered starting a Blockchain powered project?





European Union Aviation Safety Agency

Projects presentations

Jalux + Block.Aero

How a Global Startup & Japanese Multinational Corporation Implemented Blockchain Solutions for Aviation Material Management and Supply-Chain

Daher + GoodsID

Track the history of an aircraft from delivery to the present, add trust, add value, save time and propose direct access to a range of services related to the aircraft.

KLM + SkyThread

KLM E&M pioneering with SkyThread for frictionless data sharing across the aviation ecosystem, starting with the 787 community

Aviation Supply-Chain Management - Jalux

How a Global Startup & Japanese Multinational Corporation Implemented Blockchain Solutions for Aviation Material Management and Supply-Chain



Daichi SAKATA
Jalux
Assistant Manager



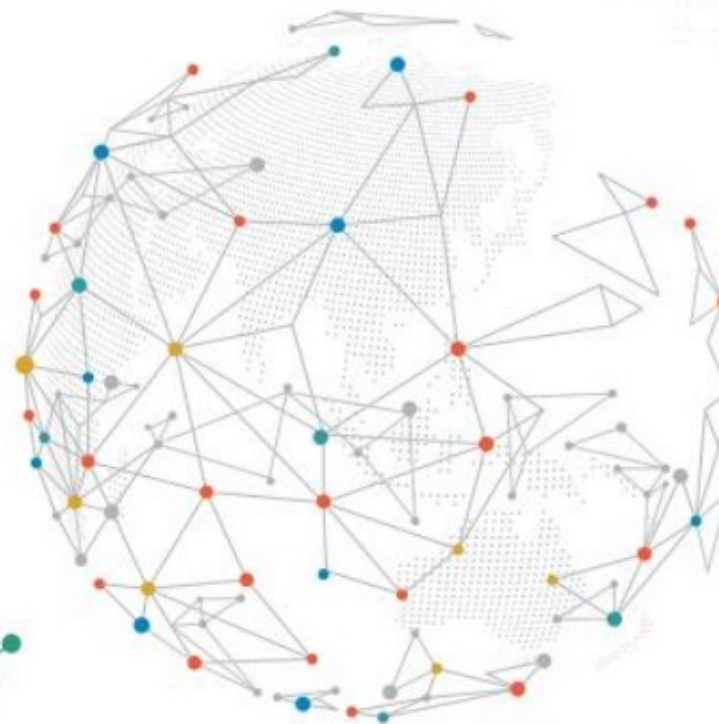
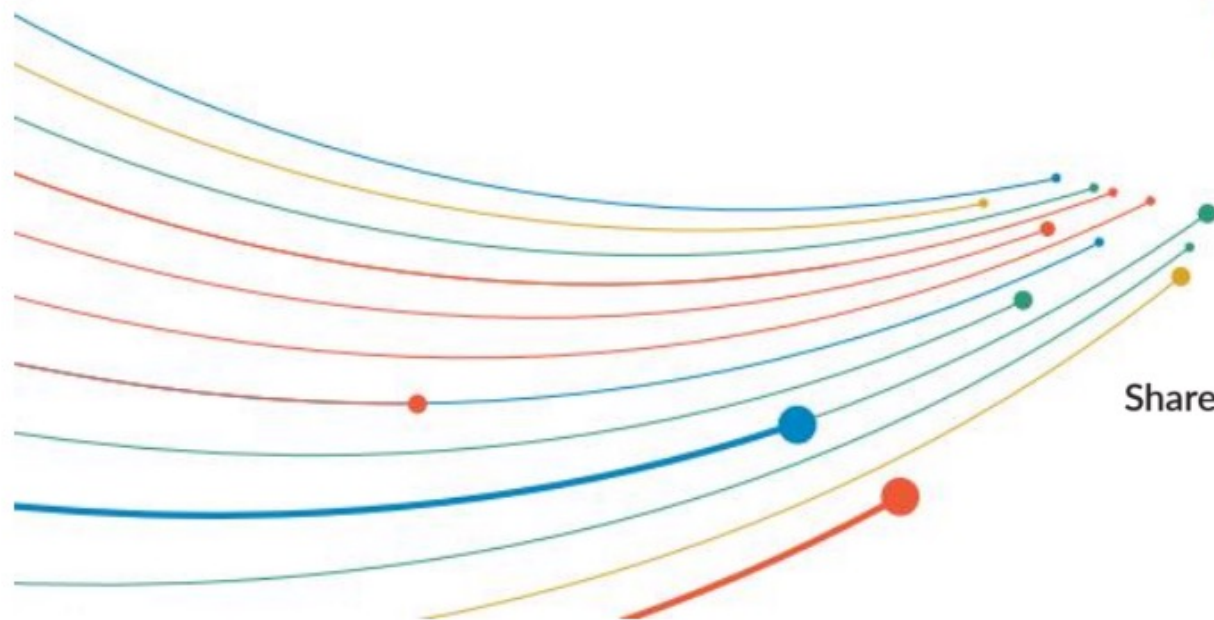
Todd SIENA
Block Aero Technologies
Founder & CEO



Block.Aero



Corporate Profile



Shareholders	SJ Future Holdings Corporation (48.14%)
	Sojitz Corporation (22.22%)
	Japan Airlines Co., Ltd. (21.56%)
	Japan Airport Terminal Co., Ltd. (8.08%)

Corporate Profile

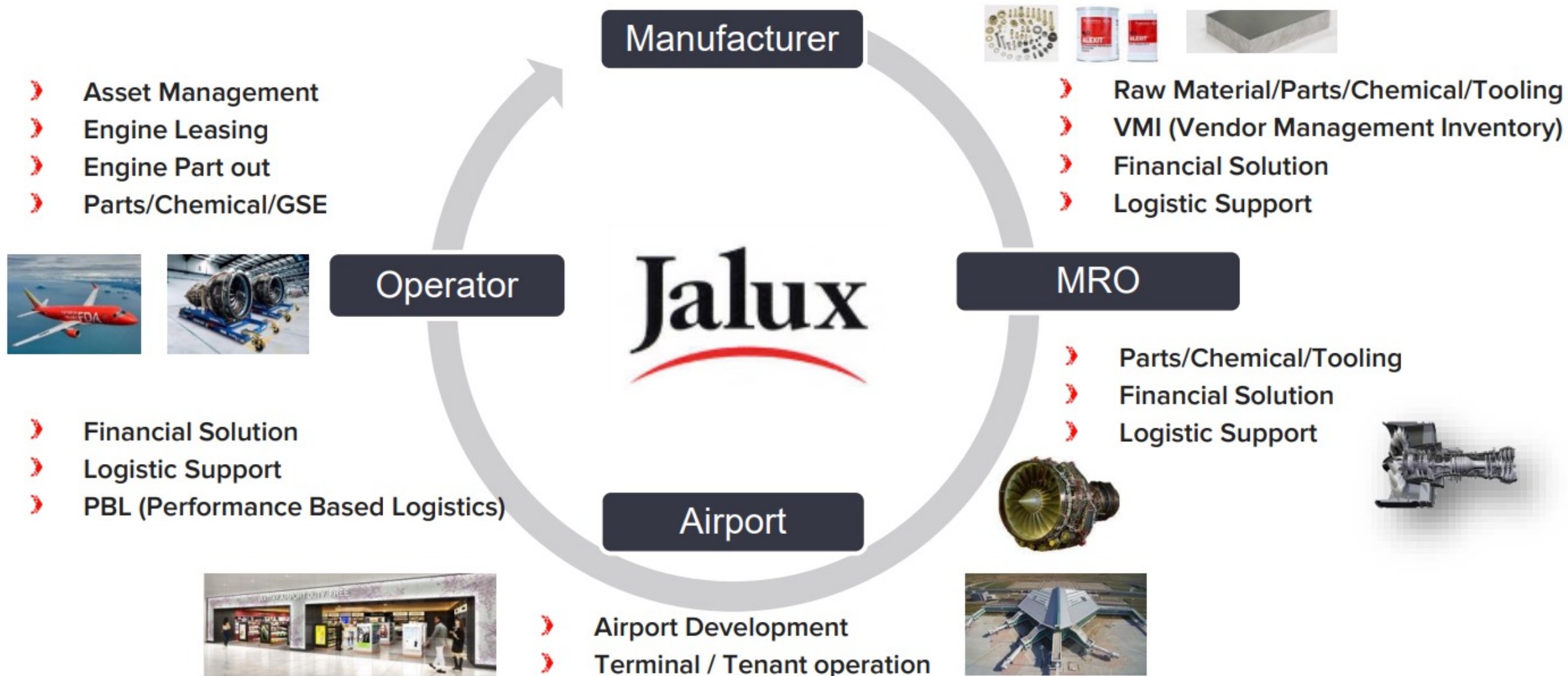


- › **Established in 1962**
- › **Capital Stock : JPY2,558 millions (March 2023)**
- › **Net Sales**
JPY 145,271 millions (March 2023)
51% Sales Growth from FY2022
- › **Employee Headcount**
Japan 1,905 incl. 1483 at consolidated subsidiaries
Year-on-Year Growth up 12% from FY2022
- › **Quality Approvals**
JALUX : AS/EN9120
JALUX Americas : ASA-100
TRACE CERTIFIED

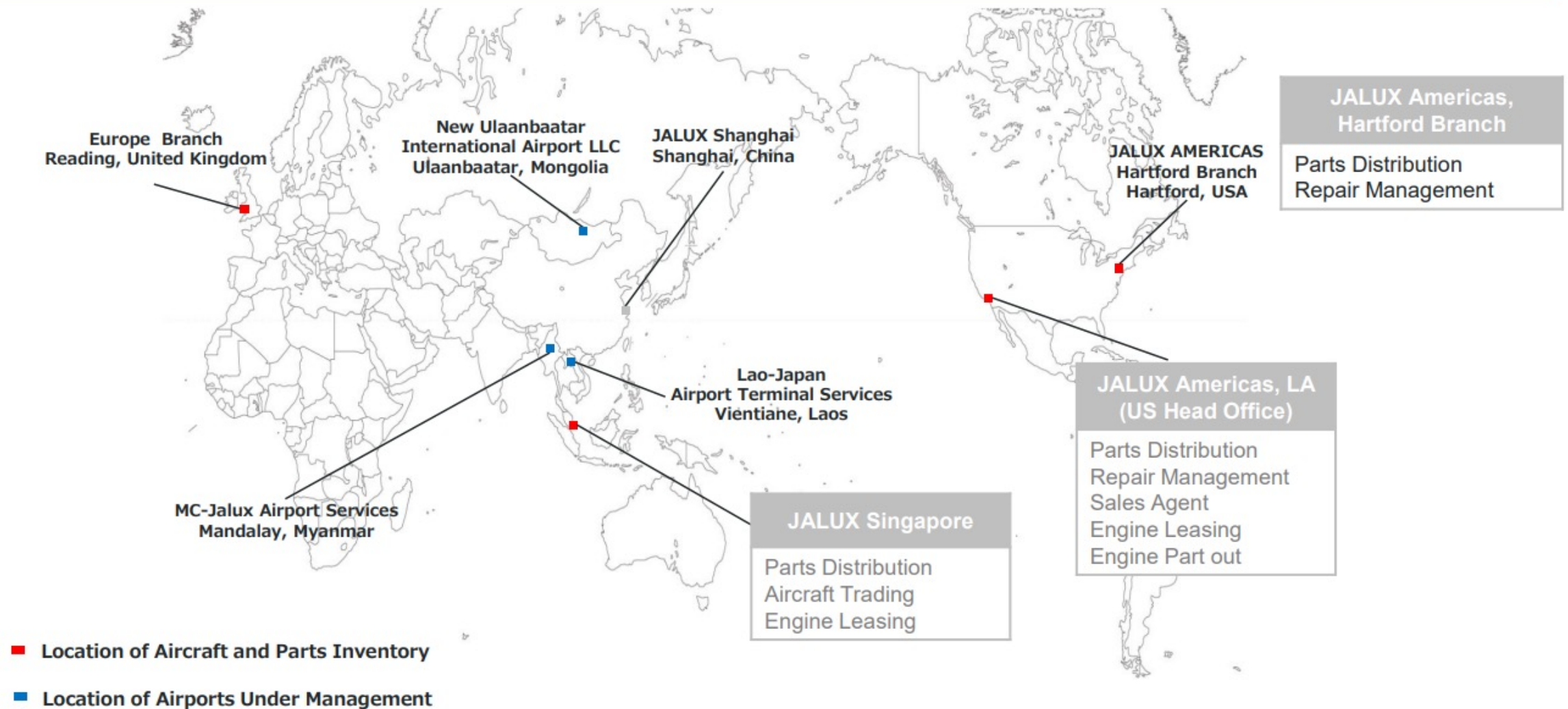


*approx. USD 1 billion in 2024 USD

Coverage of the Complete Aerospace Value Chain



Worldwide Network





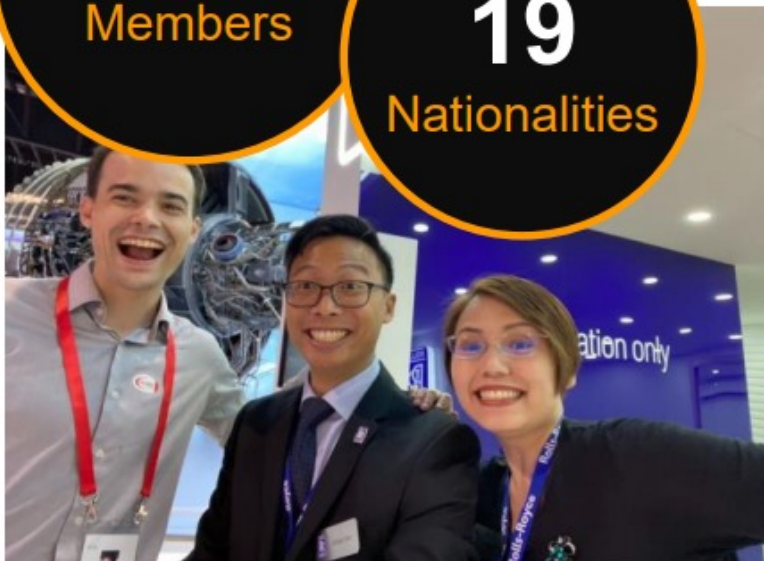
36

Team
Members



19

Nationalities



Block.Aero

Our Mission and Values



Safety ➤ Efficiency ➤ Collaboration

Leading Digital Transformation with Aviation Blockchain

Block Aero is committed to supporting UN SDGs



United Nations
Global Compact



5 GENDER
EQUALITY



7 AFFORDABLE AND
CLEAN ENERGY



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



10 REDUCED
INEQUALITIES



13 CLIMATE
ACTION

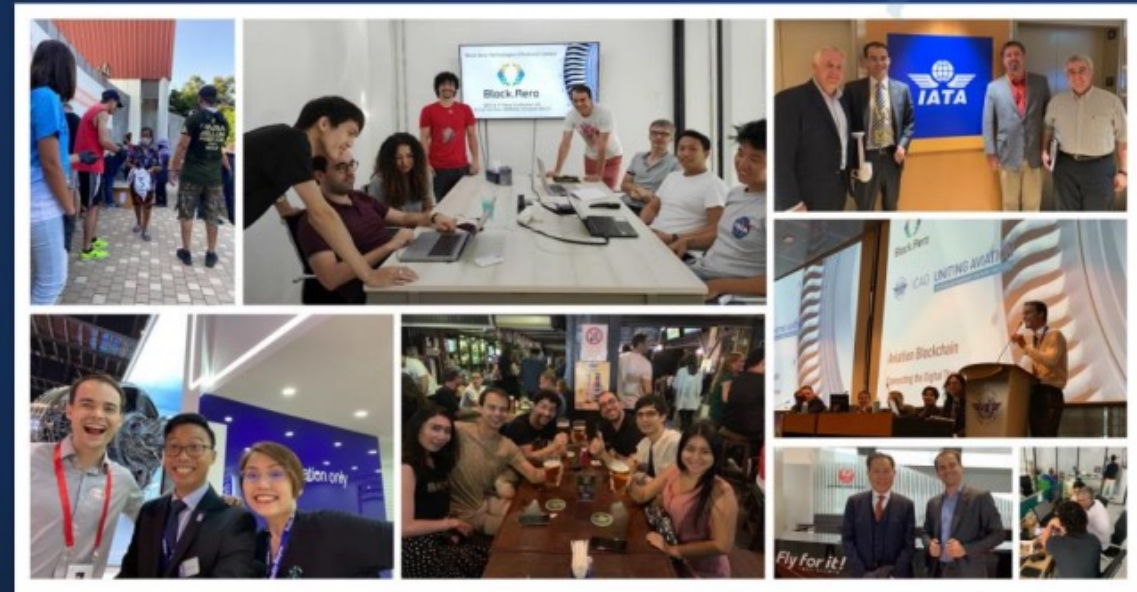


17 PARTNERSHIPS
FOR THE GOALS



Global Locations

Bangkok ○ Hong Kong
Singapore ○ Palm Beach



Jalux is Using Block Aero Aviation Blockchain Platform

Interoperable, aviation asset management platform with web enabled portals and applications.

Addresses pain points across the value chain with private permissioned blockchain databases that are replicated between organization to organization peers as shared / common / distributed ledgers for efficient data exchange, tracking of asset status, and facilitating compliance monitoring and auditing.

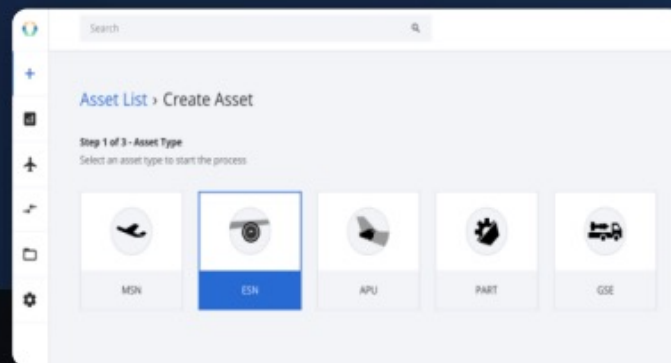




How it Works

- Easily create on-chain *digital twin* asset profiles of your aircraft, engines, and parts
- Build best in class asset pedigrees by attaching *data blocks* and immutable certificates
- Unlock the power of accessible data for your organization with transactions as *digital threads*

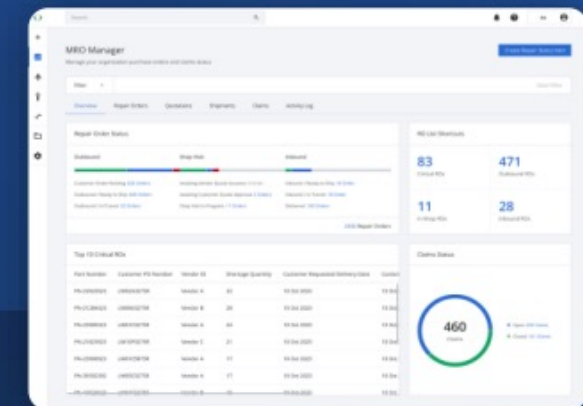
Create Assets



Attach Data Blocks



Manage Transactions



Our Japan Ecosystem Scale Snapshot on Block Aero Aviation Blockchain Network

Datasets



160,162

Data Blocks ⓘ

Immutable records of standardized data, documents, and certificates

Assets

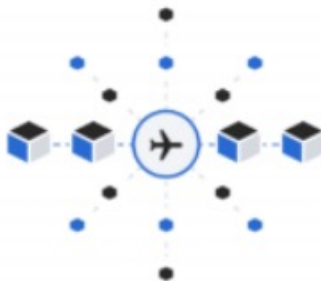


130,565

Blockchain Aviation Assets ⓘ

Digital Passports for your aircraft, engines, and parts

Transactions



11,933

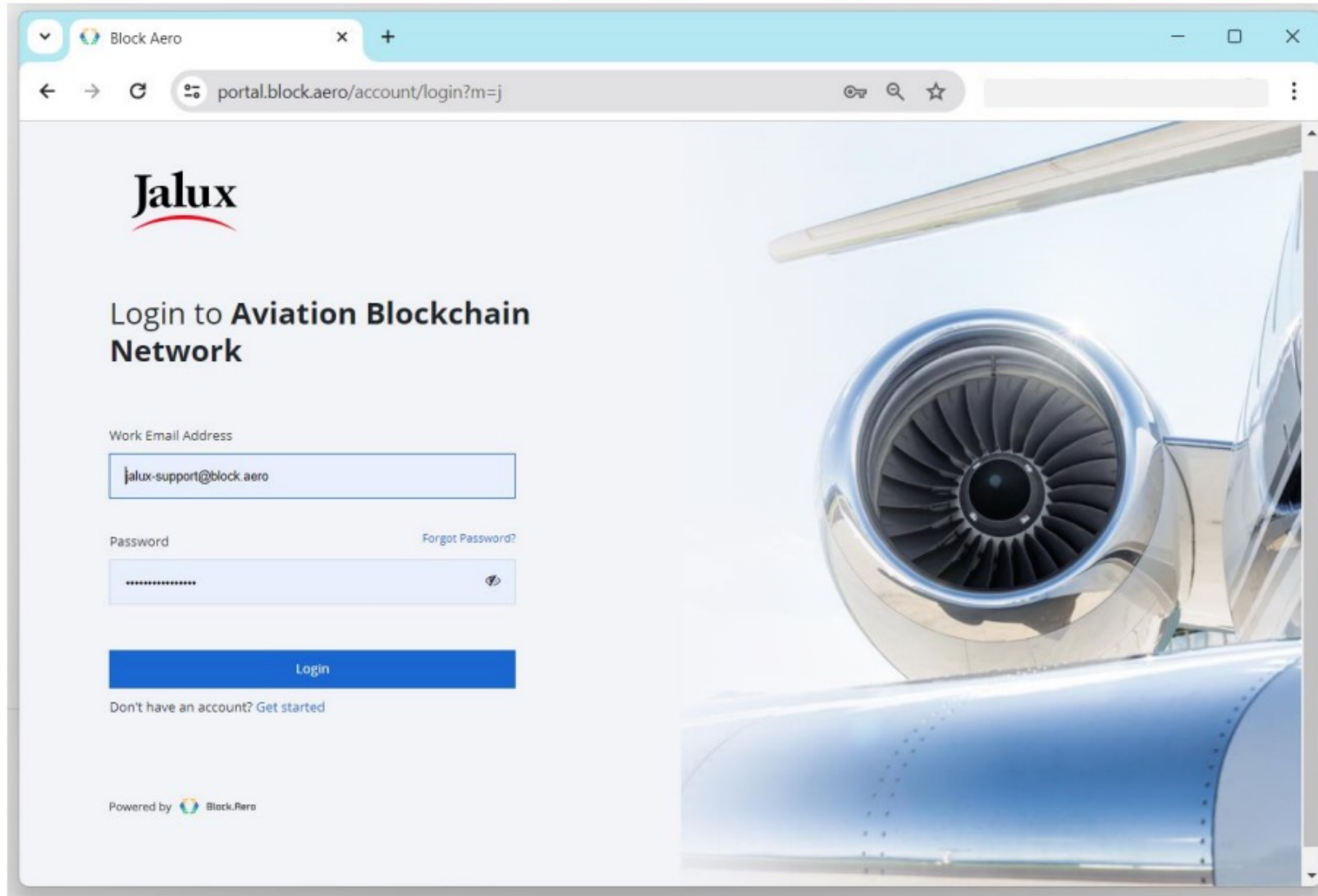
Digital Threads ⓘ

Streamlined workflows for your aerospace transactions

Our users log in to their accounts through the web portal and access Block Aero every day



Block.Aero

A screenshot of a web browser displaying the login page for the Block Aero platform. The browser's address bar shows the URL "portal.block.aero/account/login?m=j". The page features the Jalux logo at the top left. Below it, the text "Login to Aviation Blockchain Network" is displayed. There are two input fields: "Work Email Address" containing "jalux-support@block.aero" and "Password" with masked characters. A "Forgot Password?" link is next to the password field. A blue "Login" button is positioned below the fields. At the bottom left, there is a link "Don't have an account? Get started". The footer states "Powered by Block.Aero". The right side of the page has a background image of a jet engine.

- **Jalux administrates our own users and their access to the data being managed on Block Aero platform.**
- **Jalux is redistributing accounts to key partners in the local ecosystem.**

The ledger is accessed and updated 24/7 by both humans (Jalux & Customers) and machines (API services).



Block.Aero

Block.Aero

portal.block.aero/app/main/repair-status-management/activity-log

Search Assets

MRO Manager

Manage your organization's purchase orders and claims status

Create Repair Status Item

Filter

Clear Filter

Overview Repair Orders Vendor Quotes Shipments Billing Claims Activity Log

Activity Log

Search activity log...

Updated On ↓	User	Organization	Record Type	Current Record	Previous Record
9 hours ago	API Service	Jalux Inc.	Shipped Date	2024-01-20	2024-01-19
9 hours ago	API Service	Jalux Inc.	Vendor Material Received Date	2024-01-22	N/A
9 hours ago	API Service	Jalux Inc.	Customer Material Shipped Date	2024-01-20	2024-01-19
9 hours ago	API Service	Jalux Inc.	Customer Material Shipped Date	2024-01-20	2024-01-19
9 hours ago	API Service	Jalux Inc.	Customer Material Shipped Date	2024-01-20	2024-01-19
9 hours ago		Jalux Inc.	Customer Material Shipped Date	2024-01-23	N/A
		Jalux Inc.	Customer Material		

48504 Activity Logs

- Simple user experience for our employees and our customers to learn/train.
- Easy to monitor transaction status, as well as propose, accept, and reconcile asset repair orders – high volume!
- Tracks key data points and facilitates document access in the MRO workflow with Block Aero blockchain records aka *Data Blocks in Digital Threads*.

Each row in this table is an order transaction powered by blockchain records that manage data in the workflow

Block Aero

portal.block.aero/app/main/repair-status-management/repair-orders

Search Assets

MRO Manager

Manage your organization's purchase orders and claims status

Create Repair Status Item







Filter

Clear Filter

OverviewRepair OrdersVendor QuotesShipmentsBillingClaimsActivity Log

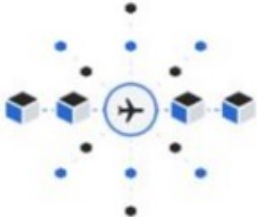
Repair Order List

Search repair orders...

	Last Updated ↓	User	Organization	PO Number	Customer PO Number	Customer Issue Number
<input type="checkbox"/>	48 minutes ago	Alison Restelli	 Jalux Inc.	23R05515	6191YQ28	V25-12702
<input type="checkbox"/>	3 hours ago	API Service	 Jalux Inc.	23R05807	6191YZ18	V25-12906
<input type="checkbox"/>	3 hours ago	API Service	 Jalux Inc.	23R05816	6191YZ22	V25-12910
<input type="checkbox"/>	8 hours ago	API Service	 Jalux Inc.	23R05781	6191YY79	V25-12888
<input type="checkbox"/>	8 hours ago	API Service	 Jalux Inc.	23R05792	6191YY73	V25-12878
<input type="checkbox"/>	8 hours ago		 Jalux Inc.	23R02989	6191TT83	V25-10719

13772 Repair Orders

Transactions



11,933

Digital Threads ⓘ

Streamlined workflows for your aerospace transactions

RSI and similar blockchain records facilitate standardization and sharing of data in MRO Manager

Block Aero

portal.block.aero/app/main/repair-status-management/RSI-cc26e325-f42e-eb8e-bd97-c279c7a5d8ce/shop-visit

Search Assets

MRO Manager > 23R05232

OverviewOrder DetailsVendor QuotesShop VisitShipmentsBillingClaimsDocuments

Repair Order Assets

Search asset part number or serial number

	Part Number	Quantity / Serial No.	Repair Status	Process Code	Scheduled Shipment...	Reported Date
>	5322121	1	Repair Completed	Repair	4 - 05 Feb 2024	
>	5322121	1	Return Unserviceable	Unrepairable	3 - 17 Jan 2024	12 Jan 2024
>	5322121	1	Return Unserviceable	Beyond Economic Repair	4 - 05 Feb 2024	23 Jan 2024
>	5322121	1	Return Unserviceable	Unrepairable	2 - 17 Jan 2024	10 Jan 2024

4 Assets

Exchange Assets

No exchange assets yet

SummaryComments (3)

General

PO Number23R05232

Repair Order StatusPartially Delivered

Last Updated1 hour ago

Updated ByJalux

Criticality Flag Submitted ByN/A

CriticalityCritical (110)

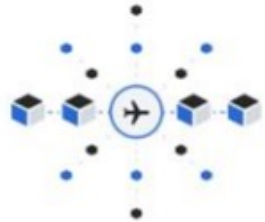
Order PriorityRoutine

Work CodeN/A

Vendor ID

Contracted Delivery Date11 Jan 2024

Transactions



11,933

Digital Threads ⓘ

Streamlined workflows for your aerospace transactions

Organizations' blockchain IDs can be assigned ORG roles that control read and write permissions to records



Block.Aero

Block Aero

portal.block.aero/app/main/repair-status-management/RSI-cc26e325-f42e-eb8e-bd97-c279c7a5d8ce/shop-visit

Search Assets

MRO Manager > 23R05232

OverviewOrder DetailsVendor QuotesShop VisitShipmentsBillingClaimsDocuments

Repair Order Assets

	Part Number	Quantity / Serial No.	Repair Status	Process Code	Scheduled Shipment...	Reported Date
>	<input type="checkbox"/>	5322121	1	Repair Completed	Repair	4 - 05 Feb 2024
>	<input type="checkbox"/>	5322121	1	Return Unserviceable	Unrepairable	3 - 17 Jan 202412 Jan 2024
>	<input type="checkbox"/>	5322121	1	Return Unserviceable	Beyond Economic Repair	4 - 05 Feb 202423 Jan 2024
>	<input type="checkbox"/>	5322121	1	Return Unserviceable	Unrepairable	2 - 17 Jan 202410 Jan 2024

4 Assets

Exchange Assets

No exchange assets yet

Order Information

SummaryComments (3)

Participating Organizations

Repair Manager

Jalux

Customer

Vendor

N/A

Commercial Reference Numbers

Customer Nominal No.

Customer Issue No.

Customer PO Number

Assets

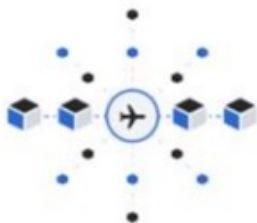
Outbound Quantity

4 Assets

Part Number

5322121

Transactions



11,933

Digital Threads ⓘ

Streamlined workflows for your aerospace transactions

Every digital thread feeds data to related aviation assets
and builds an asset-linked repository of immutable records



Block.Aero

Block Aero

portal.block.aero/app/main/repair-status-management/RSI-cc26e325-f42e-eb8e-bd97-c279c7a5d8ce/shop-visit

Search Assets

MRO Manager > 23R05232

Overview Order Details Vendor Quotes Shop Visit Shipments Billing Claims Documents

Repair Order Assets

	Part Number	Quantity / Serial No.	Repair Status	Process Code	Scheduled Shipment...	Reported Date
>	5322121	1	Repair Completed	Repair	4 - 05 Feb 2024	
>	5322121	1	Return Unserviceable	Unrepairable	3 - 17 Jan 2024	12 Jan 2024
>	5322121	1	Return Unserviceable	Beyond Economic Repair	4 - 05 Feb 2024	23 Jan 2024
>	5322121	1	Return Unserviceable	Unrepairable	2 - 17 Jan 2024	10 Jan 2024

4 Assets

Exchange Assets

No exchange assets yet

Order Information

Summary Comments (3)

Participating Organizations

Repair Manager
Jalux

Customer
[Redacted]

Vendor
N/A

Commercial Reference Numbers

Customer Nominal No.
IMF1E0015R

Customer Issue No.
[Redacted]

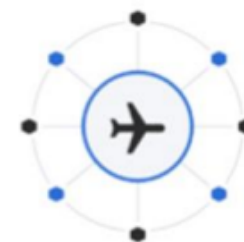
Customer PO Number
6191YC77

Assets

Outbound Quantity
4 Assets

Part Number
5322121

Assets



130,565

Blockchain Aviation Assets ⓘ

Digital Passports for your aircraft, engines, and parts

Each blockchain aviation asset (BAA) has a Digital Passport **Jalux** to secure back-to-birth events, records, and documentation



Block.Aero

Block.Aero interface showing a list of assets and their details.

Assets > PART - 0762A

Overview History Back-to-Birth Documents Compliance Logistics More

All Document Type Any date

Assets list:

- Photos 30 Sep 2022 ca56fa7daef2223b...
- Incident / Accident ... 29 Sep 2022 27d9dbcdbe06d00...
- Shop Report 29 Sep 2022 7e623149248bd2b...
- Removal Record 29 Sep 2022 7e623149248bd2b...
- Photos 29 Sep 2022 d81cac6e0a3e73f1...
- Photos 29 Sep 2022 c8ed872a10db2a9...
- Removal Record 29 Sep 2022 6b31edca76597c0...
- Incident / Accident ... 19 Oct 2020 7bb013337e720f7...

Asset Information

Details

Image of a coffee maker

P/N: 3510-0032-01U2, 14 Nov 2023

S/N: 0762A, 14 Nov 2023

Description: COFFEE MAKER

Batch Lot No.: N502UA Disassembly Project

Installed On: N/A

A/C Reg. No.: N/A

Position: N/A

ATA: N/A

Condition Status: NEW, 19 Jun 1989

Ex MSN: N/A

Ex MSN Model: N/A

Assets



130,565

Blockchain Aviation Assets ⓘ

Digital Passports for your aircraft, engines, and parts

Organizations' blockchain IDs can be assigned ORG roles that control read and write permissions to assets as well



Block.Aero

Block Aero

Search results - Google Drive

Block Aero

sandbox.portal.block.aero/app/main/assets/BAA-9c0a0df4-92d4-4ec4-32cc-88525b8cafa0/documents

Search Assets

Assets > PART - 0762A

Overview History Back-to-Birth Documents Compliance Logistics More

All Document Type Any date

Photos 30 Sep 2022 ca56fa7daaf2223b...

Incident / Accident ... 29 Sep 2022 27d9dbcd8a06d00...

Shop Report 29 Sep 2022 7e623149248bd2b...

Removal Record 29 Sep 2022 fe962b42fe4c51fd...

Photos 29 Sep 2022 d81cac6e0a3e73f1...

Photos 29 Sep 2022 c8ed872a10db2a9...

Removal Record 29 Sep 2022 6b31edca76597c0...

Incident / Accident ... 19 Oct 2020 7bb013337e720f7...

Asset Information

Details

P/N 3510-0032-01U2 14 Nov 2023 S/N 0762A 14 Nov 2023

Description COFFEE MAKER

Batch Lot No. N502UA Disassembly Project

Installed On N/A A/C Reg. No. N/A

Position N/A ATA N/A

Condition Status NEW 19 Jun 1989

Ex MSN N/A Ex MSN Model N/A

Datasets



160,162

Data Blocks ⓘ

Immutable records of standardized data documents, and certificates

Every document and record assigned to an asset has a hash value that can help validate the data integrity which helps our asset management business in compliance



Block.Aero

Block Aero

Search results - Google Drive

Block Aero

sandbox.portal.block.aero/app/main/assets/BAA-9c0a0df4-92d4-4ec4-32cc-88525b8cfa0/documents

Search Assets

Assets > PART - 0762A

Overview History Back-to-Birth Documents Compliance Logistics More

All Document Type Any date

Photos 30 Sep 2022 ca56fa7deaf2223b...

Incident / Accident Report 29 Sep 2022 27d9dbcdbe06d00...

Stop Report 29 Sep 2022 7b523149248bd2b...

Removal Record 29 Sep 2022 1e2024c1e4c51fd...

Photos 29 Sep 2022 dB1cac6e0a3e73f1...

Photos 29 Sep 2022 c8ed872a10db2a9...

Removal Record 29 Sep 2022 6b31adca76597e0...

Incident / Accident ... 19 Oct 2020 7bb013337e720f7...

Items per page 25 1-25 of 8

Asset Information

Details

Photo

P/N 3510-003-01U2 14 Nov 2022

S/N 0762A 14 Nov 2022

Description COFFEE MAKER

Batch Lot N502UA

Installed On N/A

A/C Reg. No. N/A

Position N/A

ATA N/A

Condition Status NEW 19 Jun 1989

Ex MSN N/A

Ex MSN Model N/A

Datasets



160,162

Data Blocks ⓘ

Immutable records of standardized data documents, and certificates

Organizations' blockchain IDs can be assigned ORG roles (e.g. Owner, Operator, etc.) to control read and write permissions to assets

Block Aero

Search results - Google Drive

Block Aero

sandbox.portal.block.aero/app/main/assets/BAA-9c0a0df4-92d4-4ec4-32cc-88525b8cafa0/documents

Search Assets

Assets > PART - 0762A

OverviewHistoryBack-to-BirthDocumentsComplianceLogisticsMore

All Document TypeAny date

Photos30 Sep 2022cs56fa7daef2223b...

Incident / Accident ...29 Sep 202227d9dbcd8a06d00...

Shop29 Sep 20227e623...

Photos29 Sep 2022d81cac6e0a3e73f1...

Photos29 Sep 2022c8ed872a10db2a9...

Rem29 Sep 20226b31a...

Stakeholders

OEM

Owner

Operator

Asset Manager


Digital Asset Manager

14 Nov 2023

CAMO

Asset Information

Details



P/N3510-0032-01U214 Nov 2023

S/N0762A14 Nov 2023

DescriptionCOFFEE MAKER

Batch Lot No.N502UA Disassembly Project

Installed OnN/A

A/C Reg. No.N/A

PositionN/A


ATAN/A

Condition StatusNEW19 Jun 1989

Ex MSNN/A

Ex MSN ModelN/A

Datasets



160,162

Data Blocks ⓘ

Immutable records of standardized data documents, and certificates

Production Implementation of Block Aero at Enterprise Scale



Digital Asset Manager + MRO Manager

Users: 25+ Enterprise Users

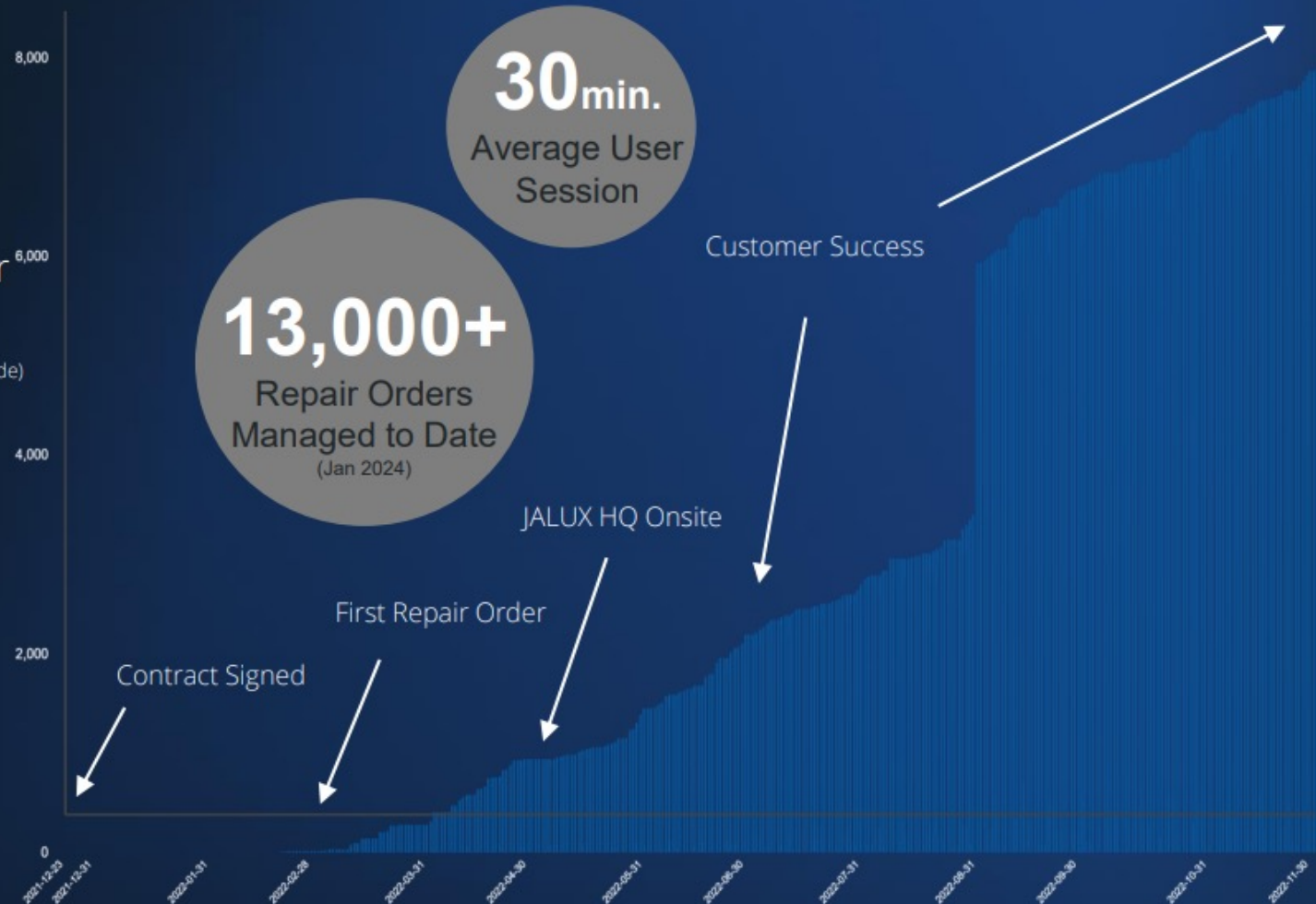
Total Transactions: 13,753 orders

Typical Tx Value: ~\$10,000 USD per repair order

Total Tx Volume: Over \$100M USD (Rough Order of Magnitude)

**Over 150,000 Blockchain Aviation Assets
(Digital Assets) Created**

JALUX Repair Order Transactions Managed on Block Aero Platform over Time



Why JALUX Selected Block Aero



Block.Aero



[Corporate Culture]

"Challenge & Change"

We regard changes in the environment
as good business chances,
and will challenge daringly on our own initiative
and continue to change to better ourselves.

[Corporate Philosophy]

"Contributing to Tomorrow"

Your partner in creating happiness and bringing a bright future to people, society and the environment.

- **Alignment of Company Mission, Vision, and Values**
- **Data Integrity and Quality** is important and required for our Quality Management System (QMS)
- **Business Value Creation** for Internal Efficiency and External Positive Customer Experience

Why a Blockchain-based Solution?



Block.Aero



1. By encrypting and decentralizing all data, tampering becomes difficult, and integrity of records is ensured.
2. Standardizing all data makes it easier to share status of assets and transactions across different organizations

Using a common distributed ledger makes data maintenance easier and can reduce operational costs versus relying on multiple, separated databases.

3. Policies and rules are systematized and can help implement standard rules for handling data in the aviation industry.

Thank you for your attention

Any questions?



Daichi SAKATA
Jalux
Assistant Manager



Todd SIENA
Block Aero Technologies
Founder & CEO



Block.Aero

Digital Aircraft Maintenance Certificate - Daher

Track the history of an aircraft from delivery to the present, add trust, add value, save time and propose direct access to a range of services related to the aircraft.



Gabriel RAFFOUR
Daher
Head of Innovation Program



Sébastien COURADET
Daher
Responsible for entry into
service for new products



Cody ST. HILAIRE
GoodsID
Aerospace & Defense VP



A Digital Unfalsifiable Aircraft Maintenance Certificate

A simple, user-friendly solution which allows the aircraft manufacturer / CAMO to issue a digital certificate for their aircraft, register the maintenance certificate in the blockchain, and transfer it to their customers

- All of the **key data** related to the aircraft are registered and time stamped in the blockchain
 - Manufacturer
 - Aircraft Model
 - Serial Numbers
 - Registration
 - Initial Certificate of Airworthiness
 - Operational Validity
 - Additional User Selected Documents

- Thanks to blockchain technology, this digital certificate is **unique, tamper-proof, unfalsifiable, immutable and unhackable**



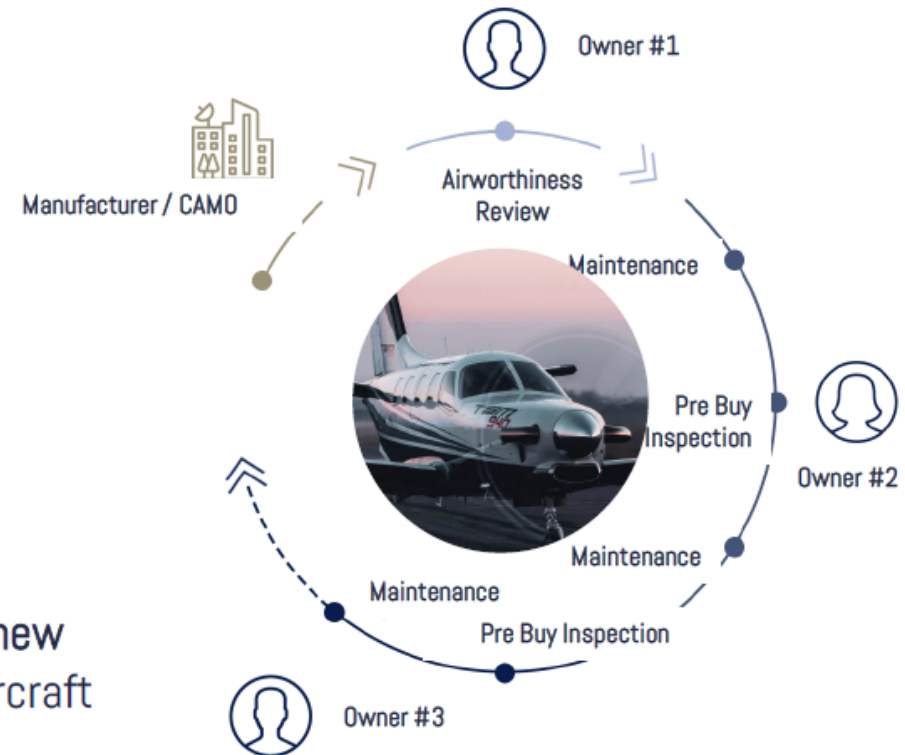
A Dynamic Maintenance Record

Track the history of an aircraft from delivery to the present

- Register within the certificate the **scheduled maintenance work** and **specific events** during the **lifetime** of the aircraft:

- Scheduled maintenance
- Airworthiness review
- Pre-buy inspection
- Transfer of ownership
- Change of registration

- Register and regularly **update the flight hours**
- **Transfer the digital maintenance certificate to the new owner of the aircraft** in the event of a sale of the aircraft
 - Total and **full respect of the anonymity** of the aircraft's owner
 - Ownership transfers are registered on an **anonymous basis**



A User-Friendly Aircraft Certificate - Features





1. Product specifications
2. Possibility to add regulatory documents


 **DOCUMENTS**

- [TBM 940 Technical specifications.pdf](#) 
- [APRS First 20200630 TBM940 1290.pdf](#) 
- [CEN 20201227 TBM940 1290.pdf](#) 
- [Pre-buy inspection report 20210214 TBM94...](#) 
- [Certificate of registration TBM940 1290 F-A...](#) 
- [Initial CofA TBM940 1290.pdf](#) 

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Issued by **Daher Aerospace** on December 5, 2021









 **Daher Aerospace**
TBM 940

FEATURES

HISTORY

Serial :	1290
Manufacturing year :	2020
Registration :	N940EA
Initial Certificate of Airworthiness :	2020-03-08
Ability to fly until :	2022-03-07
Flight hours as of July 14, 2021 :	149

DOCUMENTS

- [TBM 940 Technical specifications.pdf](#) 
- [Initial CofA TBM940 1290.pdf](#) 
- [Certificate of registration TBM940 1290 F-A...](#) 
- [CEN 20201227 TBM940 1290.pdf](#) 
- [APRS First 20200630 TBM940 1290.pdf](#) 
- [Pre-buy inspection report 20210214 TBM94...](#) 

Description

POWERPLANT
P&W Canada PT6A-66D turboprop.
Thermodynamic power 1825 hp.
Nominal power 850 shp.
Usable fuel capacity 291 US gal. 1,100 liters.

EXTERNAL DIMENSIONS
Wingspan 42.10 ft. 12.833 m.
Height 14.29 ft. 4.355 m.
Length 35.22 ft. 10.726 m.
Wheel base 9.56 ft. 2.914 m.
Tailplane span 16.36 ft. 4.988 m.







LOADING
Basic empty weight 4,629 lb. 2,097 kg.
Maximum ramp weight (MRW) 7,430 lb. 3,370 kg.
Maximum takeoff weight 7,394 lb. 3,354 kg.
Maximum zero fuel weight 4,032 lb. 1,828 kg.
Maximum payload 1,403 lb. 636 kg.
Maximum payload with full fuel: 891 lb. 404 kg.
Maximum luggage in storage areas (4 seats) 507 lb. 230 kg.
Maximum luggage in storage areas (6 seats) 330 lb. 150 kg.
Maximum luggage volume (large net): 301 cu. ft. 8.589 cu. m.

PERFORMANCE (ISA conditions, MTOW, no wind).
Maximum cruise speed at long-range settings 252 KTAS 467 km/h.
Maximum cruise speed at 28,000 ft. 330 KTAS 611 km/h.
Time-to-climb to 31,000 ft. 18 min. 45 sec.
Certified ceiling 31,000 ft. 9,449 m.

RUNWAY DISTANCES (ISA conditions, MTOW, no wind, 50 ft. obstacle clearance).
Takeoff: 2,380 ft. 726 m.
Landing: 2,430 ft. 741 m.
Max. range with max. fuel (at 31,000 ft. with 45 min fuel reserve):
- 252 KTAS cruise speed 1,730 NM 3,204 km.
- 290 KTAS cruise speed 1,585 NM 2,935 km.
- 326 KTAS cruise speed 1,440 NM 2,666 km.


A User-Friendly Aircraft Certificate - History




3. Scheduled maintenance and events registered in the blockchain

	Pre-buy inspection	May 13, 2021 
Inspection date (YYYY-MM-DD)	2021-05-13	
Flight hours	127	
Attached document	Inspection_report_20210513_T...	
Registered on (YYYY-MM-DD)	2021-05-14	
By	Daher CAMO	
	See transaction details	
	Airworthiness review	February 28, 2021 
ARC date of issue (YYYY-MM-DD)	2021-02-28	
ARC expiration date (YYYY-MM-DD)	2022-03-07	
Flight hours	98	
Attached document	ARC_20210228_TBM940_1290.pdf	
Registered on (YYYY-MM-DD)	2021-03-03	
By	Daher CAMO	
	See transaction details	
	Scheduled maintenance	December 4, 2020 
Type	First	
Service center	Daher Tarbes	
Certificate of Release to Service date (Y...	2020-12-04	
Flight hours	72	
Attached document	CRS_First_20201204_TBM940...	

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Issued by Daher on December 10, 2019







DOCUMENTS


- [CRN_1283.pdf](#)
- [Certificate of registration_1283.pdf](#)


Daher
TBM 940


FEATURES**HISTORY**


**Change of Registration Number**


30 Jan 2021 


New registration number : N940ES
From : 27 January 2021
Flight hours (FH) : 330.3 FH
Registered by Private owner
[See transaction details](#) 





**Transfer of Ownership**


19 Jan 2021 


Transferor : Daher
Transferee : Private owner
Date of transfer : 10 January 2021
Flight hours (FH) : 292.2 FH
Registered by Daher
[See transaction details](#) 


**Pre-Buy Visit**


4 Jan 2021 


Date : 2 January
Flight hours :
Registered by
[See transaction details](#) 





**Airworthiness Review Certificate (ARC)**


2 Jun 2020 


ARC renew date : 27 May 2020
ARC expiration date : 28 May 2021
Flight hours (FH) : 136.4 FH
Registered by Daher CAMO
[See transaction details](#) 





**Scheduled maintenance**

2 Jun 2020 

Type : A+
Service center : Daher Tarbes
CRS date : 27 May 2020
Flight hours (FH) : 136.4 FH
Registered by Daher CAMO
[See transaction details](#) 



**Scheduled maintenance**

10 Dec 2019 

Type : First
Service center : Daher Tarbes
CRS date : 5 December 2019
Flight hours (FH) : 58.6 FH
Registered by Daher CAMO

Benefits Of The Maintenance Certificate For The Aircraft's Owner

ADD TRUST



A digital, certified, tamper-proof, and unfalsifiable service record book for the aircraft

SAVE TIME



A digital maintenance certificate makes resale easier by adding trust to the product by recording its history

ADD VALUE



A digital maintenance certificate which increases the value of the aircraft in the event of a resale vs an aircraft without a digital certificate

MORE SERVICES



Direct access to a range of services related to the aircraft, potentially offered by the issuer or affiliated third parties (aircraft manufacturer / CAMO) and included in the certificate : maintenance, insurance, parts tracking etc...

Benefits Of The Maintenance Certificate For The Certificate Issuer (Aircraft Manufacturer / CAMO)

INCREASE SECURITY

► Add transparency, trust and security to the aircraft for the owners' benefit

BETTER TRACKING

► Follow their aircraft during the entire product life and on the secondary market

ADDITIONAL BUSINESS

► « Connect » the future owner of the aircraft in case of the resale of the aircraft (the maintenance certificate is transferable to the new owner) so that the issuer can offer dedicated services to the new owner of the certificate

ADD SERVICES

► Offer dedicated services related to the aircraft (maintenance, insurance, secondary marketplace...)

Add Value And Trust During The Resale of the Aircraft

1

The aircraft maintenance certificate has been updated throughout the life of the aircraft (including pre-buy inspections and reports)



2

The owner (seller) of the aircraft can show the certified unfalsifiable service record book of the aircraft to the new potential buyer with one simple click "Share the Certificate"



3

The potential buyer is sent a link for direct access to the entire history of the aircraft and to its regulatory documents



4

Once the sale is completed, the seller transfers the aircraft maintenance certificate to the new owner of the aircraft

Thank you for your attention

Any questions?



Gabriel RAFFOUR
Daher
Head of Innovation Program



Sébastien COURADET
Daher
Responsible for entry into
service for new products



Cody ST. HILAIRE
GoodsID
Aerospace & Defense VP



Component Services in Age of Blockchain - KLM E&M

KLM E&M pioneering with SkyThread for frictionless data sharing across the aviation ecosystem,
starting with the 787 community



Paolo MONTI
KLM E&M Big Data
Project Lead
Component Blockchain



Joerg GARSKE
SkyThread
Head of Business
Development Europe



AGENDA

- **Air France Industries – KLM Engineering & Maintenance**
- **The challenge of reliable data availability and integrity within aviation ecosystem**
- **Blockchain as a technical viable solution**
- **AFI KLM E&M and SkyThread for Parts**
- **Value for all ecosystem players**

WE ARE AFI KLM E&M



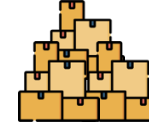
LIMITED HISTORY, VISIBILITY, AND TRUST



Country	2 中国民用航空局 CAC 中国民航局 Confédération 解放区 Airworthiness	3 证书编号 Certificate Ref No.	8108467	
P.R. CHINA	AUTHORIZED RELEASE CERTIFICATE/AIRWORTHINESS APPROVAL TAG			
Organization	Société Air France 45 rue de Paris 95747 ROISSY CDG Cedex France	5 工作单/合同号/票号 Work Order/Contract/Service	6 备注/备注 Remarks	
名称 Description	1E 序号 Part No.	2 适用性 Eligibility	3 日期/批号 Serial/Batch No.	4 产品批号 Status/Work
ACTION CONTROL ELECTRONICS	488053-1-0-02	288888	5 04551	IMPECTED/TESTED
Remarks: BAE SYSTEMS	098 27-02-01 00017	00015		

[illegible][illegible][illegible]

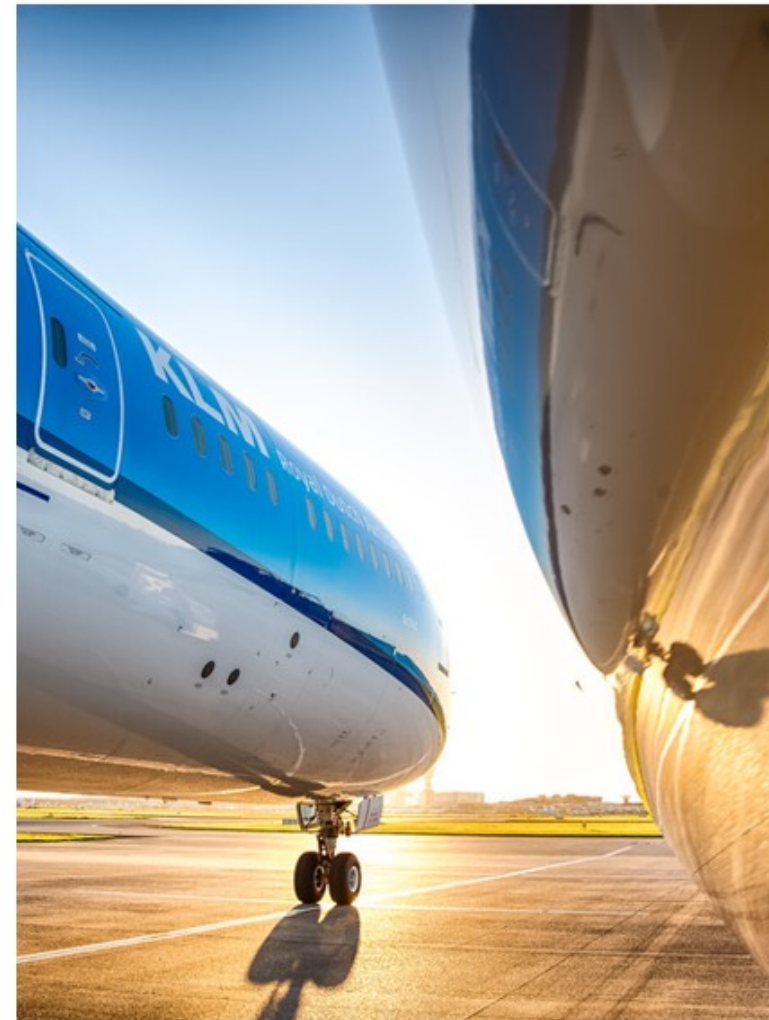
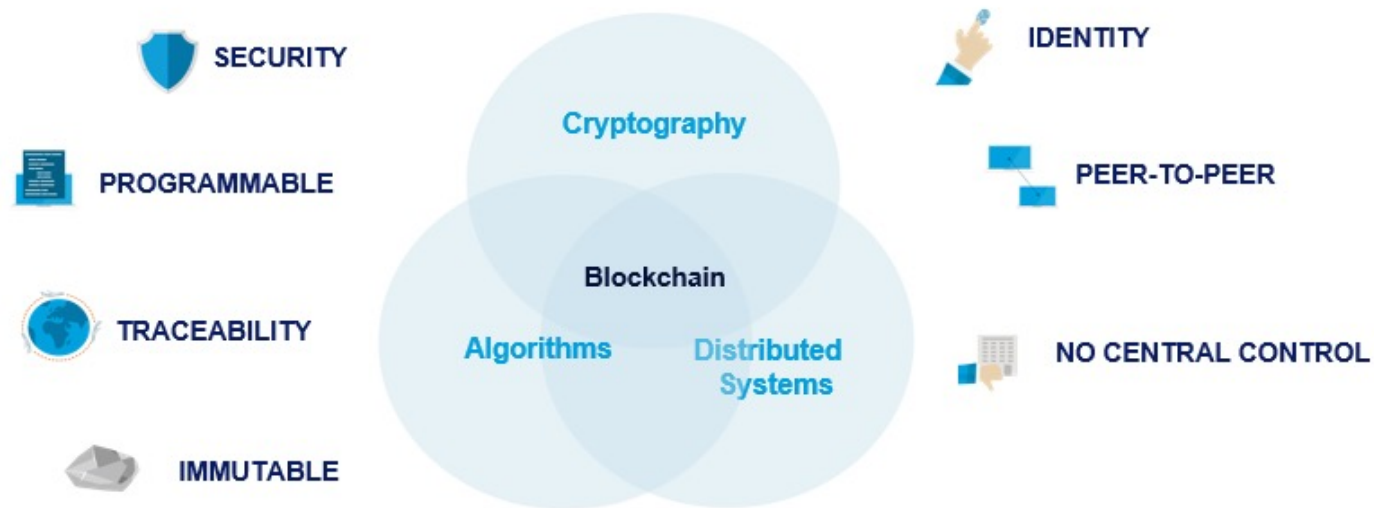
AIRFANCE /		FAX : 33 (0) 141 560 165	
45 rue de PARIS F-95747 ROISSY CHARLES DE GAULLE CEDEX		TLX : RSVLOAF	
WORK SHOP REPORT		No: 8015580	
Customer...: KLM (ROYAL DUTCH AIRLINE)		Dossier.....: 1788998	
Work Order...: D8039856N01		Requisition No.: 50554703	
Designation : WASTE SYSTEM VACUUM BLOWER			
Part Number...: 606802-2		TSN.: 78540	
Serial Number...: 6540		CSN.: 11691	
Removal from A/C.: PH8QL		Pos.: 02	
Aircraft Model...: 777 300ER		Time...: 60213	
Removal Date...: 14MAY18		Cycles.: 7869	
Location.: SPL			
Removal Type...: UNSCHEDULED			
Removal Reason...: US			
Condition as received.....: VERY DIRTY.			
Work requested.....: REPAIR			
Warranty requested.: Warranty Accepted.:			



A GLOBAL COMPONENTS LIFECYCLE REGISTER

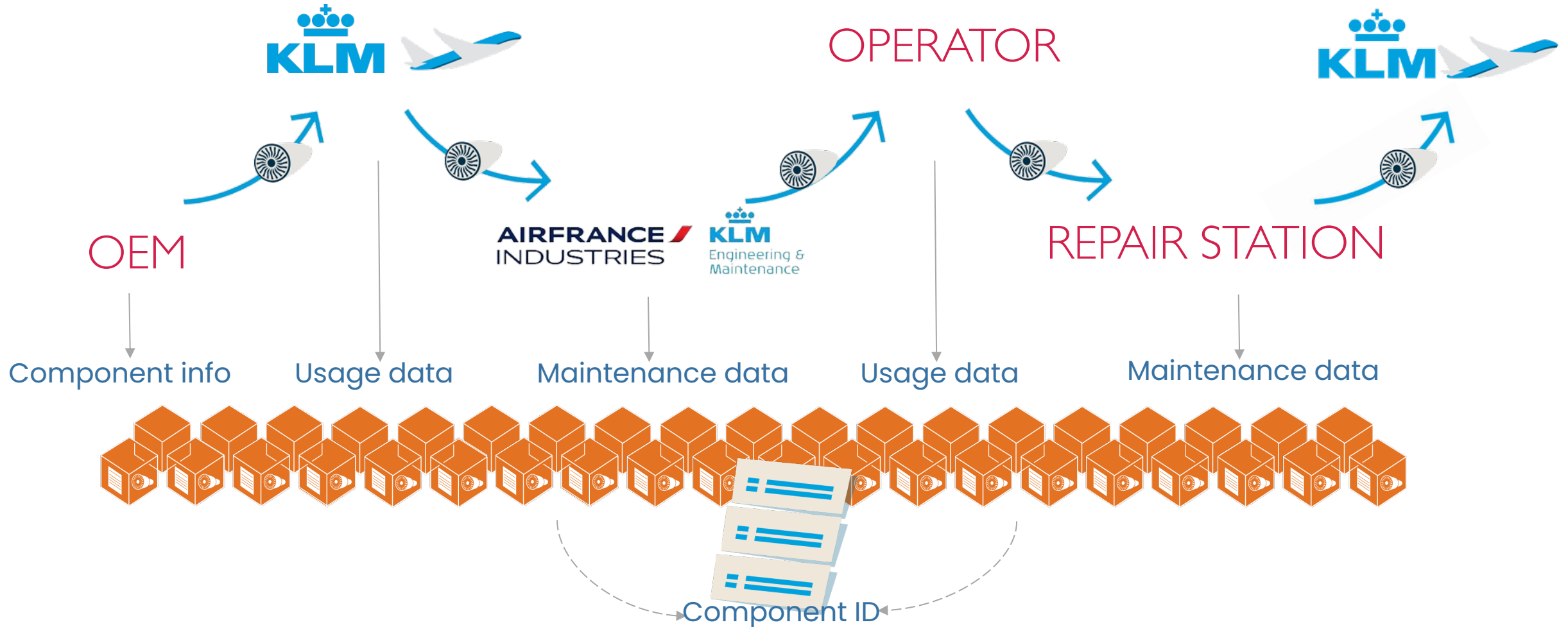
OUR ASPIRATION

Create a **global single shared** data register for events and configuration status of aircraft components through their lifecycle to create **trust and transparency** in the aviation ecosystem; leveraging blockchain technology to ensure data access, integrity and security



THE BLOCKCHAIN BASE CONCEPT EXPLAINED

HOW DOES IT WORK?



THREE CONDITIONS FOR SUCCESS

AFI KLM E&M 2018 INDEPENDENT PROOF-OF-CONCEPT FINDINGS



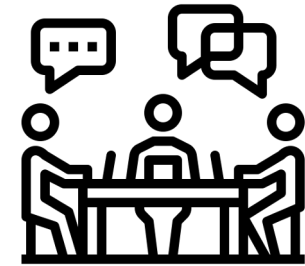
Ecosystem

Effort must be **common** to
avoid point solutions



Trust

Independent and **Neutral**
service provider



Joint Rulemaking

Consortium government
needed

AFI KLM E&M – SKYTHREAD PARTNERSHIP

SKYTHREAD FOR PARTS FOR OUR 787 COMPONENT POOL PRODUCT



- Independent, **neutral**, service provider, leveraging a combination of aviation industry & IT expertise
- SkyThread for Parts introduces a Software-as-a-Service (SaaS) data sharing network delivering **value to all stakeholders** in aviation industry.


ADAPTIVENESS®

AFI KLM E&M and SkyThread lay the foundations for partnership in the digital aviation ecosystem

AFI KLM E&M and SkyThread have collaborated on a unique and innovative solution for managing aircraft components data. The two partners are now joining forces to start deployment and enable value generation for all stakeholders.



Digital Thread




**Powered by
Blockchain Secured
& Distributed**




**Backed by an
Independent
Industry Consortium
(IDCA)**

SKYTHREAD FOR PARTS AT KLM E&M

LIFECYCLE EVENT FLOW AND PART HISTORY INTERFACE



[Upload Event](#)[Parts](#)[My Cockpit](#)[Event Upload Errors](#)



[Logout](#)

[← Back](#)

Part Occurrence Details

Part Occurrence Id :

2b4446dddc264c72bf5fca846db4dc9172fala60ab58f7d874cf9611cbd15ead

Part Number :

66572-201-B

Previous Part Numbers :

66572-201; 66572-201-A

Serial Number :

Demo3SAF01_66572-M9206

Part Description :

ESCAPE SLIDE DOOR 2 LH

Manufacturer (Cage) Code :

70167

Manufacturer Name :


SAFRAN

Part Occurrence Event History (Click on event date for details)

Dec 01 2022
10:26:08

Receive Part In Inventory

Nov 29 2022
14:36:42

MRO Repair and Ship 

Nov 26 2022
06:48:12

Receive Part at MRO

Nov 25 2022
07:34:52

Ship Part to MRO

Nov 24 2022
15:26:08

Receive Part In Inventory

Nov 24 2022
11:03:06

Removal


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Starting Feb 2024

1M+ Events
(part birth, install/removal...)
and Service Reports

10

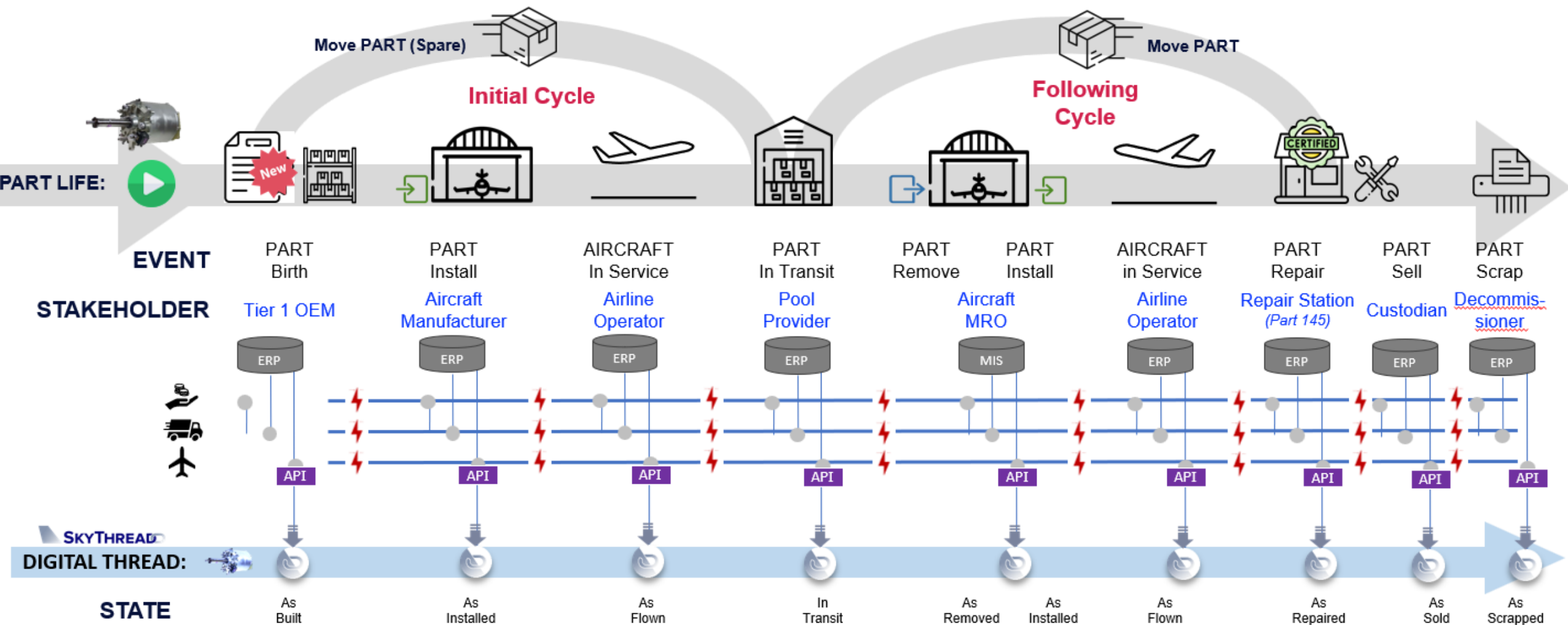
AIRFRANCE
INDUSTRIES


Engineering & Maintenance

ADAPTIVENESS®

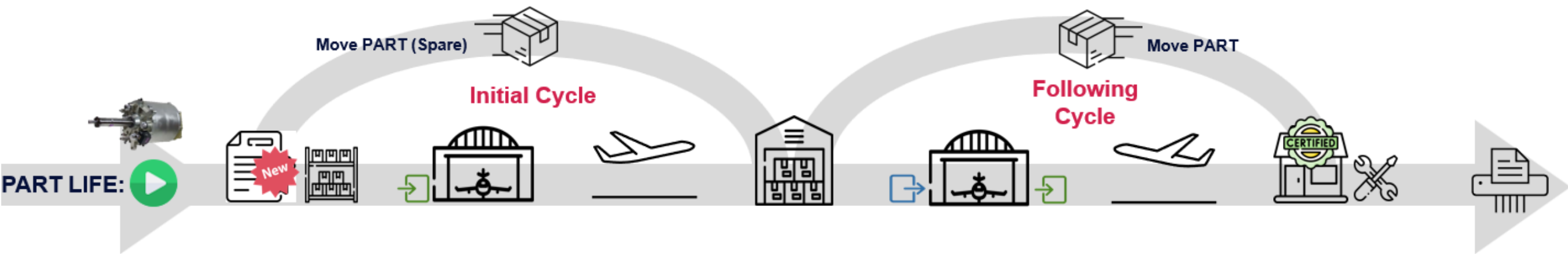
SKYTHREAD FOR PARTS DIGITAL THREAD

RECORDING OF EVENTS INFO FROM DIFFERENT PLAYERS IN A SINGLE THREAD



SKYTHREAD FOR PARTS VALUE FOR OUR ECOSYSTEM

REDUCING LEAD TIME, COSTS AND MITIGATING RISKS FOR THE MRO SUPPLY CHAIN



EVENT	PART Birth	PART Install	AIRCRAFT In Service	PART in transit	PART Remove	PART Install	AIRCRAFT (back) in Service	PART Repair	PART Sell (USM)	PART Scrap
STAKEHOLDER	Tier 1 OEM	Aircraft Manufacturer	Airline Operator	Pool Provider		Aircraft MRO	Airline Operator	Repair Station (Part 145)	Custodian	Decommissioner
STATE	As Built	As Installed	As Flown	In Transit	As Removed	As Installed	As Flown	As Repaired	As Sold	As Scrapped
Lead Time		✓				✓		✓	✓	✓
Costs				✓				✓	✓	
Full History / Authentication	✓	✓	✓	✓		✓	✓	✓	✓	✓

DATA EXCHANGE AND RETRIEVAL, EASY, QUICK AND SECURE.

- **Enabler towards fully digital data exchange.**
No more manual transaction data acquisition.
- **Reduce risk of late releases due to documentation**
- On-demand complete data for independent pool-parts **reliability and performance assessment**
 - Past service reports and overhaul records
- Fast and **reliable back-2-birth** information:
 - Ownership, repair record, certificates
- **Part Authentication**
 - Reduce risk of counterfeit documentation/parts

Component Services Providers

- **Enabler towards fully digital data exchange.**
No more manual transaction data acquisition.
- **Easy, on-demand, access to complete service & repair history**
 - Usage data: operator(s) and hours/cycles
 - Past service reports and overhaul records
- Fast and **reliable back-2-birth** information:
 - Ownership, repair record, certificates
- **Part Authentication & Export Control**
 - Reduce risk of counterfeit documentation/parts

- **Enabler towards fully digital data exchange.**
No more manual transaction data acquisition.
- On-demand complete data for **reliability and performance assessment and demand planning**
 - Past service reports and overhaul records
 - Usage data: operator(s) and hours/cycles
- **Part Authentication & Export Control**
 - Reduce risk of counterfeit documentation/parts

Airline
Operators

Tier 1 & OEMs

Thank you for your attention

Any questions?



Paolo MONTI
KLM E&M Big Data
Project Lead
Component Blockchain



Joerg GARSKE
SkyThread
Head of Business
Development Europe



Next steps

Collaboration and stakeholder interviews

Currently we are finalising the information gathering stage, where we want to get the complete views from aviation stakeholders.

If you would like to **collaborate**, and your view to be heard we would be glad to conduct an in depth interview.

Specially, if you are from one of these stakeholders' groups:

OPERATORS

LESSORS

OEMs

Future steps in the project

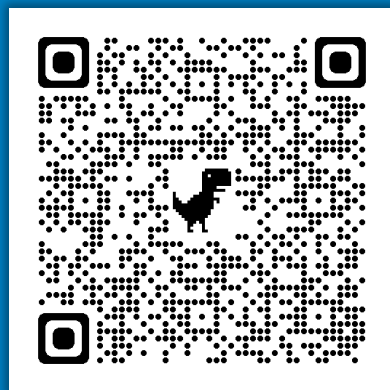
A project closing & **dissemination event** will take place this summer, where the results of the research project will be presented, as well as **training material** to blockchain-based solutions and their use in the industry.



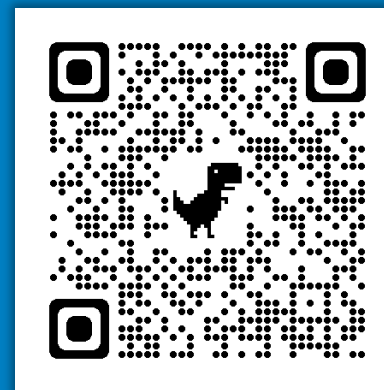
European Union Aviation Safety Agency

More information:

EASA web



VIRTUA LinkedIn group



Thank you!