MATTR
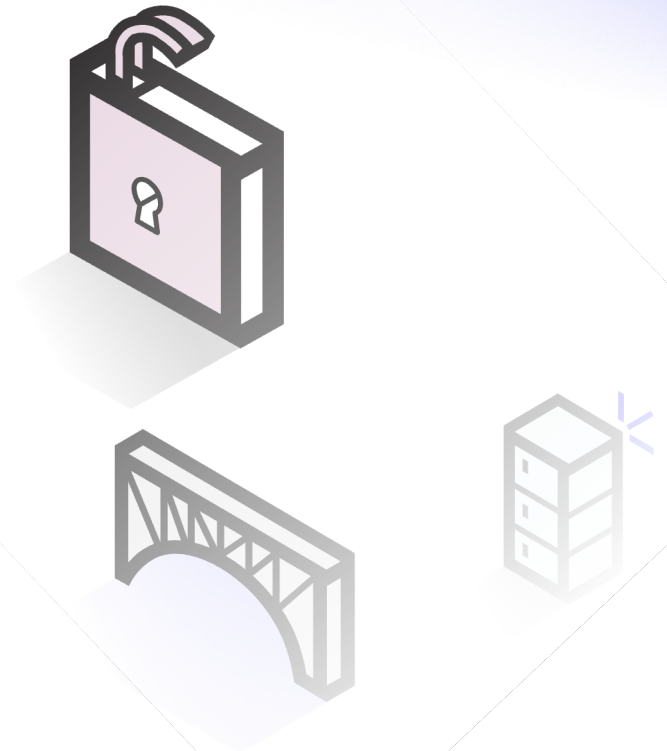
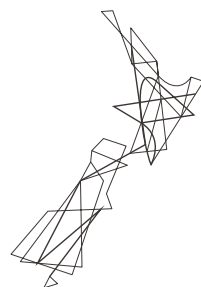# ICAO Air Cargo Digitalization in COVID-19 times

MATTR – ICAO

28th June 2022

Who is MATTR?

Based in Auckland, New Zealand

MATTR is a standards-based organisation building next generation scalable infrastructure for digital trust.

Your global technical expert

We work with the global standards community, organisations and a range of technical experts to develop technology that's interoperable and is aligned to best practice – so you don't have to.

Standards organisations

W3C®   DIF   IETF   OpenID

Luke McIntyre
CPO

Creating verifiable data supply chains

Credentials

Digital Identity

+

Augmented with additional layers of
value, integrity and assurance.

Supports the security and accountability
of all parties in an ecosystem.

Encompass any kind of signed data that is used to prove things about real world entities.

Building trust to build relationships across the supply chain

Solving real world problems …

Is this organisation who they say they are?

Do we know who issued it and can we trust them?

Is this credential up to date?

Can I understand the context of the claims?

Is this information putting our reputation at risk?
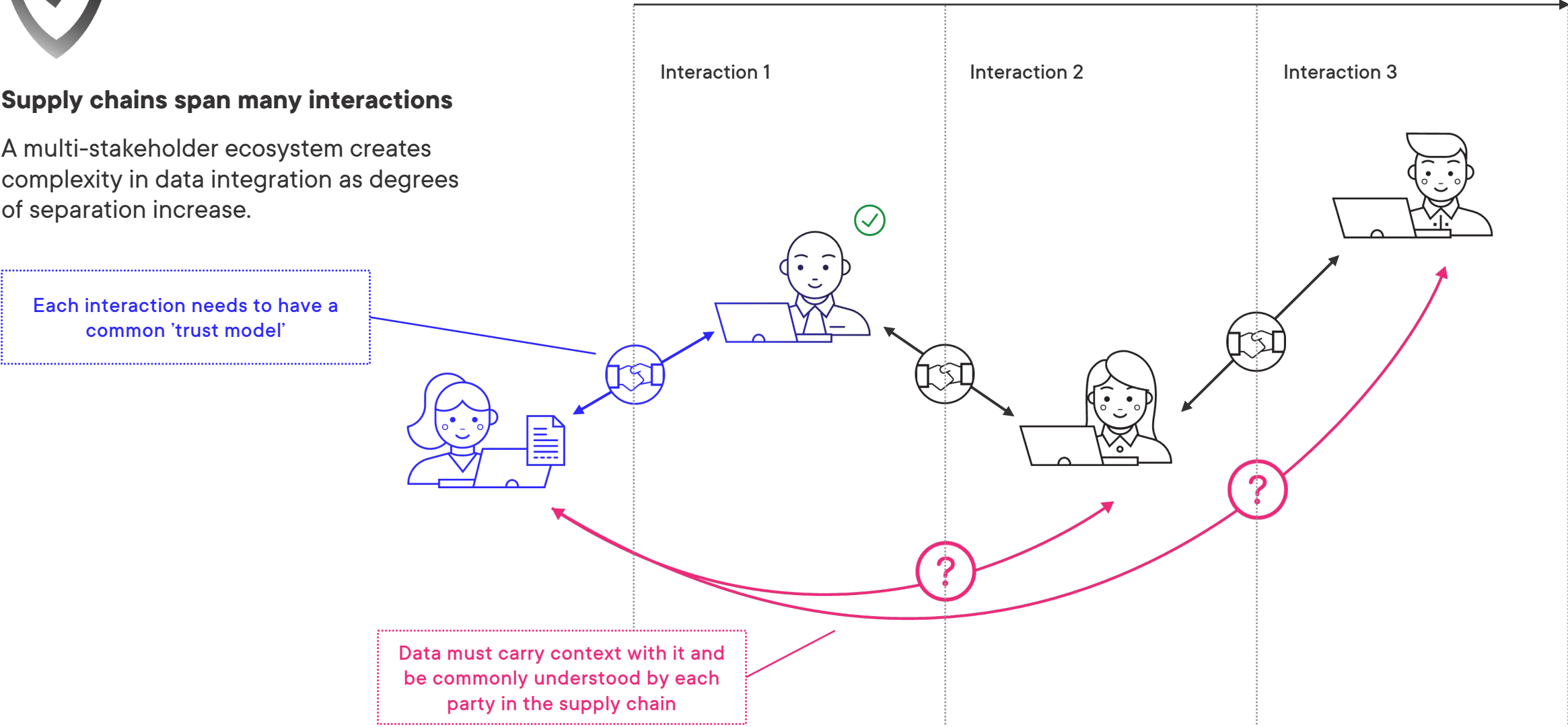
Simple, convenient tools to make life easier

- ✓ Confidently operate across entities, domain boundaries and jurisdictions

- ✓ Reduce risks (data quality, fraud) and improve confidence in integrity and authenticity

- ✓ Protect the supply chain from bad actors

- ✓ Remove friction and create efficiencies

- ✓ Data that carries it's own context gives improved understanding

- ✓ Auditable by design

Degree of separation

Interaction 1   Interaction 2   Interaction 3

Supply chains span many interactions

A multi-stakeholder ecosystem creates complexity in data integration as degrees of separation increase.

Each interaction needs to have a common 'trust model'

Data must carry context with it and be commonly understood by each party in the supply chain

Supply chains span many interactions

A multi-stakeholder ecosystem creates complexity in data integration as degrees of separation increase.

Verifiable data with machine readable context

Creates an ecosystem that instantly builds trust despite the degree of separation.

Degree of separation

Interaction 1

Interaction 2

Interaction 3
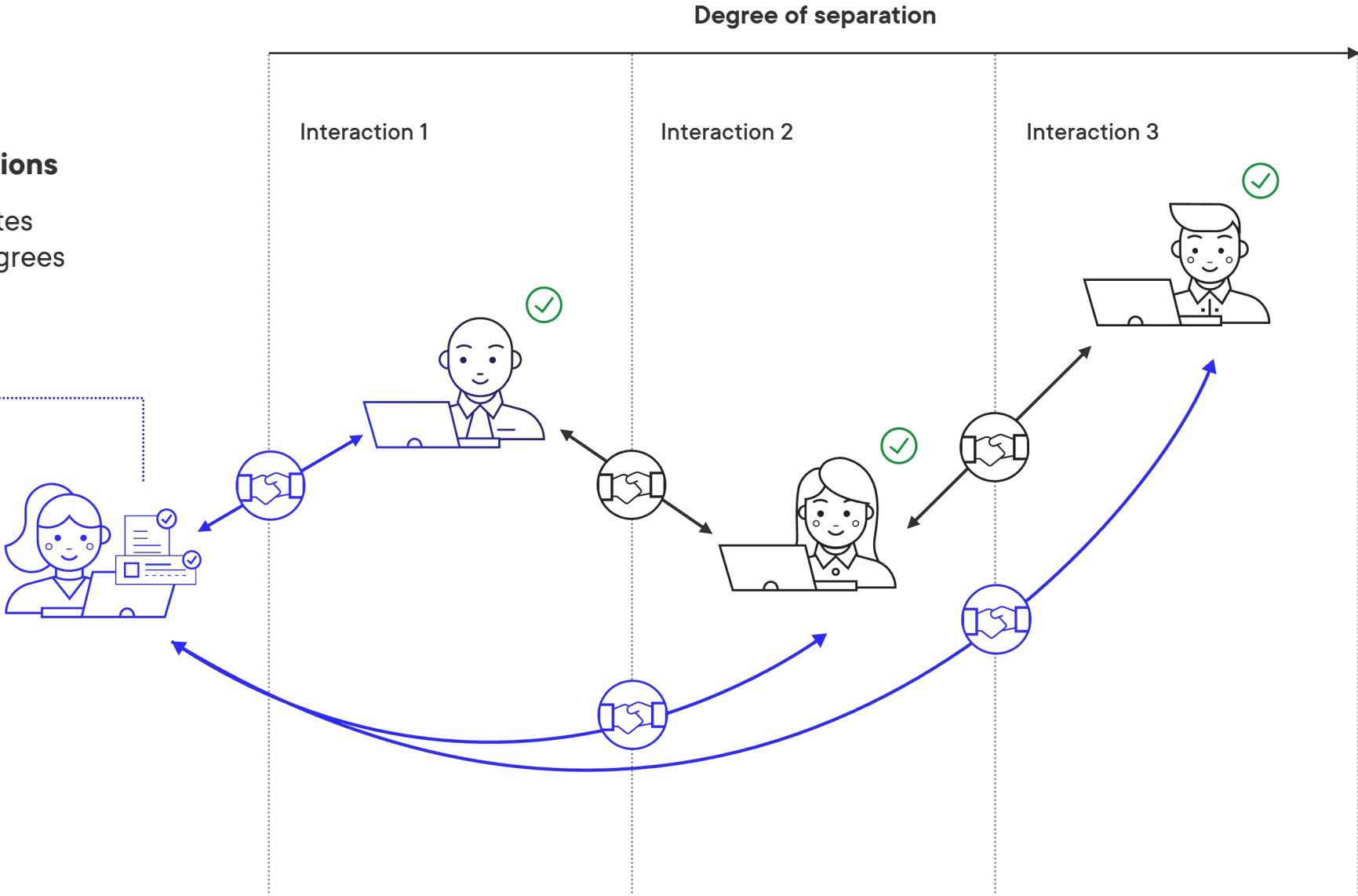
Open standards to enable interoperability at scale

- W3C Verifiable Credentials / DIDs provides a flexible and interoperable data and trust model for claims to made about a person, organisation or thing.

- Verifiable Credentials can be transmitted across many parties in the eco-system **at scale** (all using different vendors) without the need for complex integrations to create trust.

- These standards can be the basis for many different use cases from air cargo to credentials about people and are tested for interop and conformance in real world scenarios using cross vendor 'plug-fests'.

Develop, Refine, Use and Champion Global Standards to Ensure Interoperability

Verifiable Credentials	Decentralized Identifiers	Privacy and Credential Lifecycle Management
- A set of claims made by an issuer about a subject in a manner that is: - Tamper evident - Cryptographically verifiable - Digital version of physical credentials/attestations - Driver's Licenses - Passports - Certificates of Origin	- Globally Unique Identifier without the need for a central registration authority - Immutable over time - Globally resolvable - Privacy respecting - Cryptographically verifiable	- Tackling the hard challenges of scalable implementation - Confidential Storage - Data Portability - Selective Disclosure - Revocation with Herd Privacy - Path to Standardization via IETF & W3C

Verifiable Credentials Data Model 1.0
Expressing verifiable information on the Web
W3C Recommendation 19 November 2019

Decentralized Identifiers (DIDs) v1.0
Core architecture, data model, and representations
W3C Candidate Recommendation Snapshot 18 March 2021

Portions of the work on this specification have been funded by the United States Department of Homeland Security's Science and Technology Directorate under contracts HSHQDC-16-R00012-H-SB2016-1-002 and HSHQDC-17-C-00019. The content of this specification does not necessarily reflect the position or the policy of the U.S. Government and no official endorsement should be inferred.

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Verifying Global Interoperability … in Practice

| Standards Conformance via Automated Test Suites	Multi-Vendor Interoperability via Plugfests
- DHS/SVIP mandates the demonstration of standards compliance using automated conformance test suites - Contributed to by DHS/SVIP Performers and many others - Developed under the purview of the W3C Credential Community Group (Not DHS) - With input sought and accepted from the Global technical community **This is not enough!**	- Standards are compromises and as such do not ensure interoperability on their own! - Standards allow for multiple ways to accomplish the same thing - Standards allow for multiple ways to represent the same thing - DHS/SVIP mandates the demonstration of interoperability via a NxN matrix testing of the multiple vendors under contract - Open to working with non-DHS funded entities in separate "community plug-fests"

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VC HTTP API Test Suite

Test environment

PLATFORM PLATFORM PLATFORM PLATFORM PLATFORM PLATFORM PLATFORM PLATFORM

VC HTTP API Spec

Test objectives

fixtures → Test harness → report

Role of the Test suite
Tests core issuance and verification capabilities for a variety of different credential types against different DID methods and signature suites. "Backend-level testing"

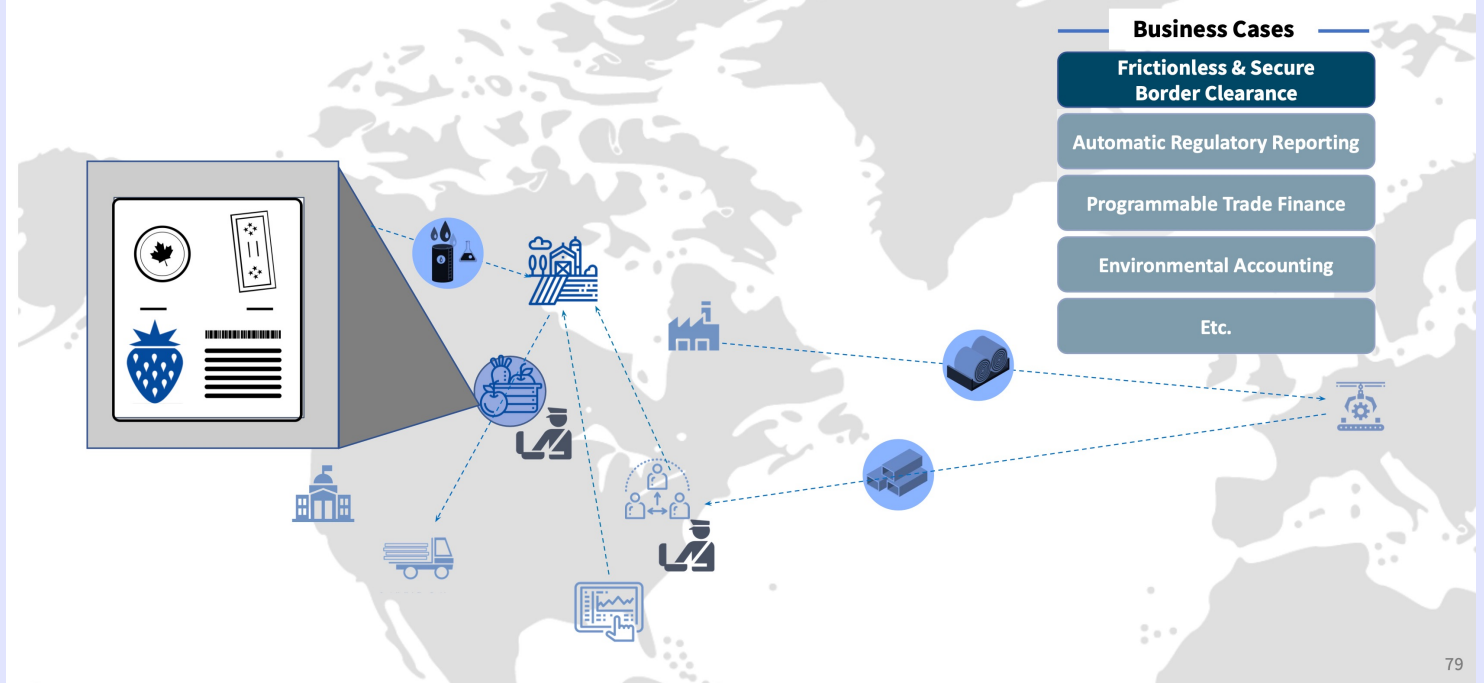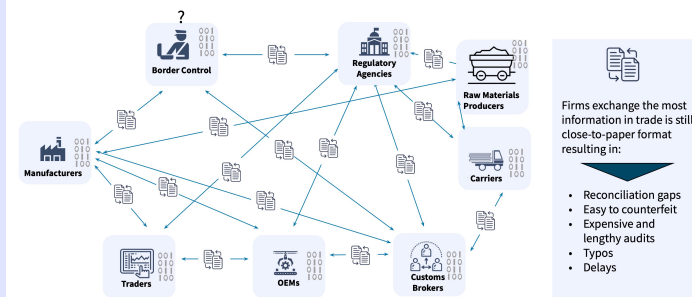| Issuance	Verification
Credential Types	
Signature Schemes	
DID Integration (method & resolution)	
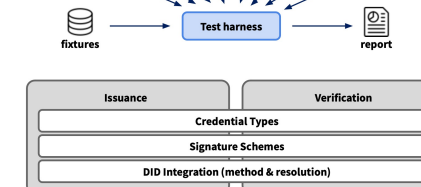
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Fully digitised trade needs highly trusted 'verifiable data supply chains'

- Each stakeholder in a given use case has common requirements for authenticity and assurance across the eco-system

- Data that passes through the parties must carry its context – in W3C VCs this happens using common terms or 'vocab'.

- The W3C CCG has already worked to define many specific vocabs for this purpose (https://w3c-ccg.github.io/traceability-vocab/)

We are aiming at building a future where trade is fully digital, which opens a wide range of business and technical opportunities

Business Cases
- Frictionless & Secure Border Clearance
- Automatic Regulatory Reporting
- Programmable Trade Finance
- Environmental Accounting
- Etc.

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The complexity of supply chains makes it hard to traceback documentation of a specific asset, as the information does not typically travel with the asset itself.

Firms exchange the most information in trade is still close-to-paper format resulting in:

- Reconciliation gaps
- Easy to counterfeit
- Expensive and lengthy audits
- Typos
- Delays

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An open traceability vocabulary is being used for asserting verifiable credentials related to asset traceability information
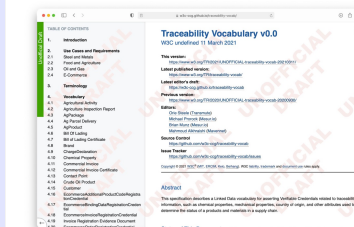
- Built based on existing Schema.org and GS1 vocabulary elements
- Standardizes the creation of Verifiable Credentials from standardized JSON-LD, which is generated from JSON Schemas
- Currently supports primary contributions from five main market segments: Agriculture, E-Commerce, Oil, Gas, and Steel and Metals
- GS1 compatible extensible representations of Organization, Bill of Lading, and Inspection Reports
- Hosted under the W3C umbrella and open to contributions

[Link]
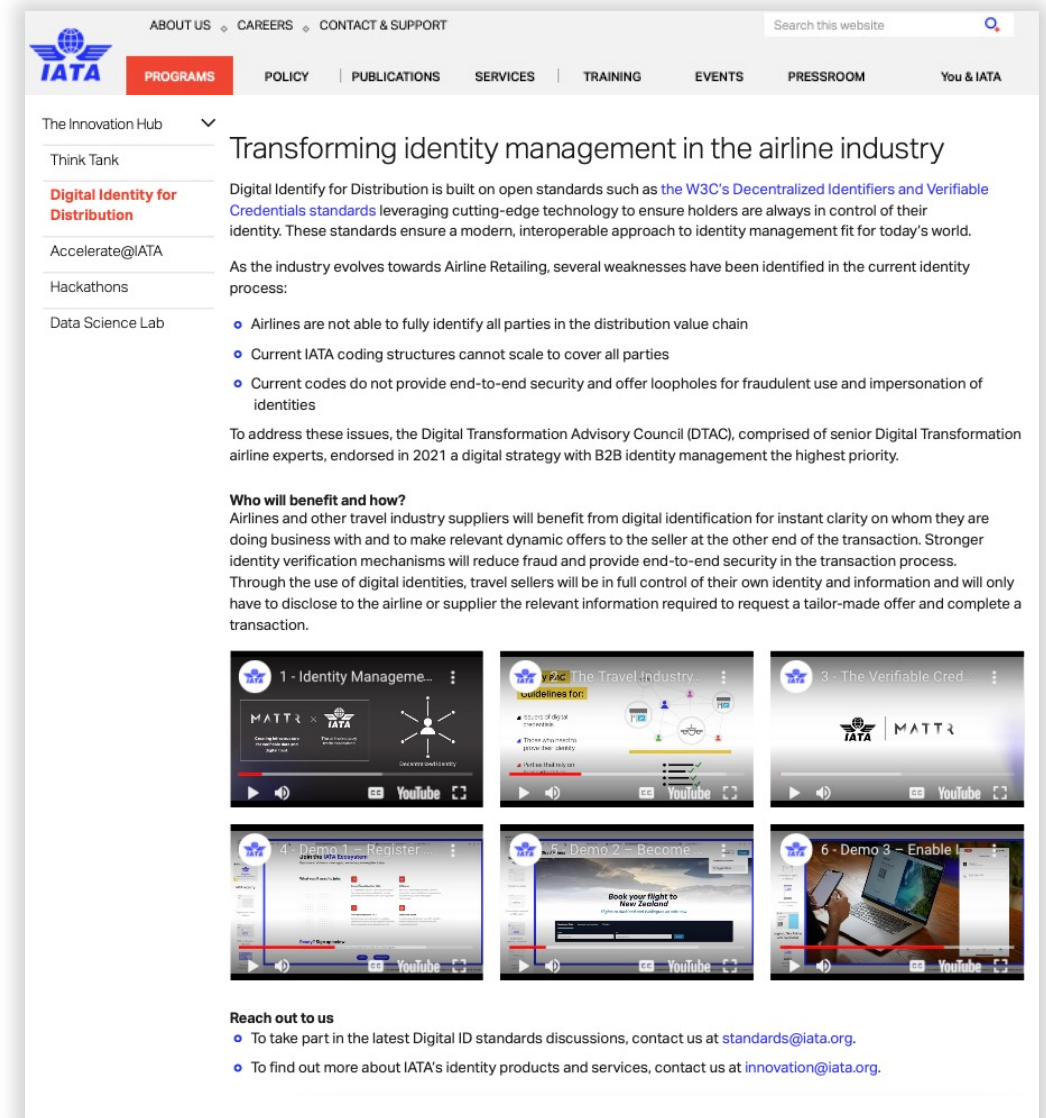
Contributions and feedback are welcome!!

8 MATTR

Implementation in a B2B context

IATA's B2B Identity Management strategy

MATTR is supporting a new IATA innovation initiative:

- Focused on airlines and parties in the distribution chain

- Uses decentralised identity capabilities to modernise IATA coding structures

- Allows identification of transfer of verifiable data at scale across industry

- Provides end to end security counter fraud and impersonation across parties in the distribution chain.

www.iata.org/en/programs/innovation/digital-identity/

Credential ecosystems in the wild: Implementation learnings at scale
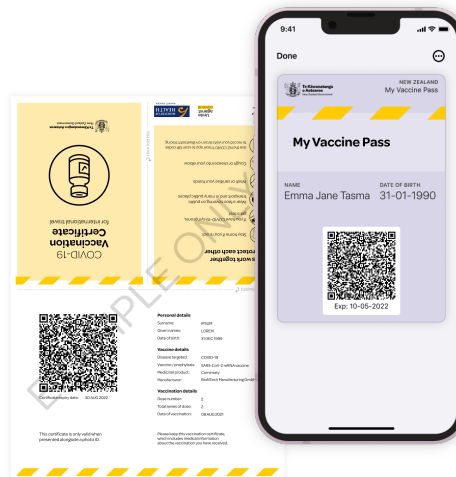
DHS USCIS SVIP

Who

Credential type

W3C JSON-LD VC

HEALTH

Who

Credential type

- EU DCC
- NZCP – W3C CWT VC

AIRLINE

Who

B2B

W3C JSON-LD VC
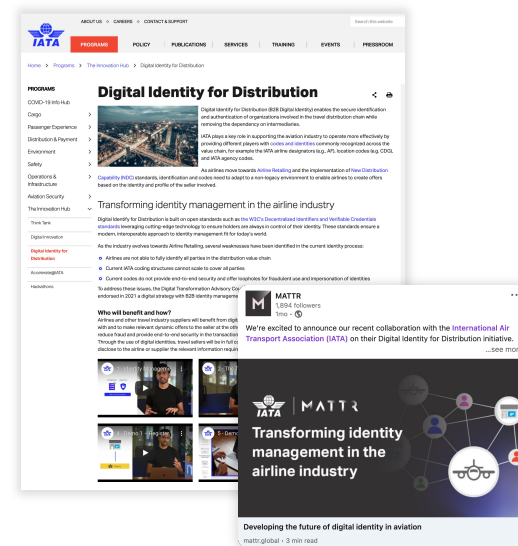
EDUCATION

Who

Credential type

W3C JSON-LD VC

MATTR – as an expert partner

In our industry and customer partnerships MATTR typically:

Represent their interests in the technical standards communities

Provide expertise in trust architecture design

Technical and implementation considerations both influence the trust architecture.

- **Provide ecosystem support**

  Practical support that is valuable in establishing and maintaining ecosystems for interoperability and adoption.

  This can include development of standards profiles, test harnesses and bridging capabilities to support community adoption and long-term innovation.

- **Regular roadmap alignment and interlock**

  We constantly investing in our product. Our priorities are market and vision driven and we work with strategic partners and customers through **MATTR Labs** to ensure we stay aligned in both R&D efforts and our product roadmap.
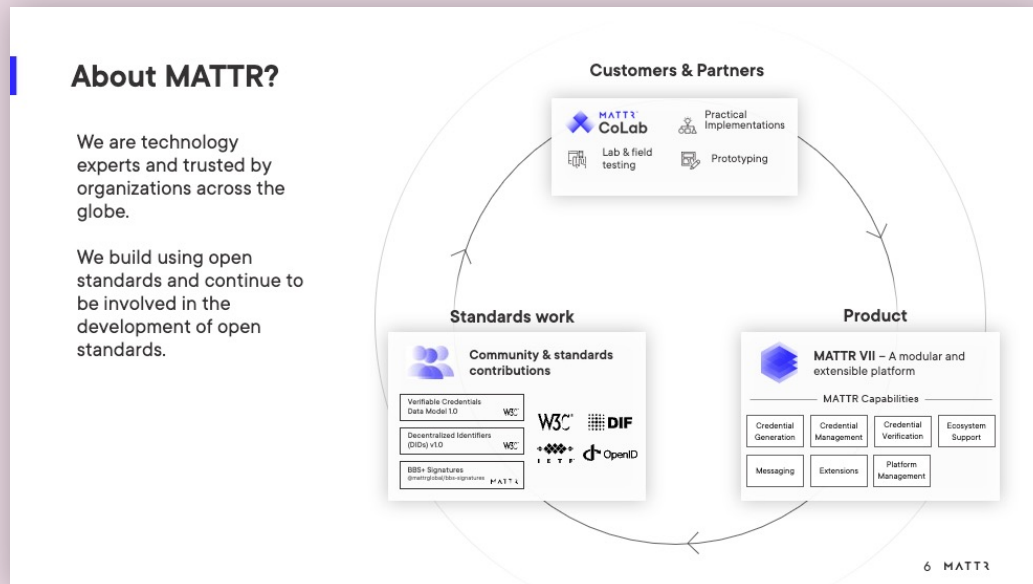
Questions & Resources

Contact us:

info@mattr.global

Website

mattr.global

MATTR has extensive experience in these standards across a wide variety of use cases

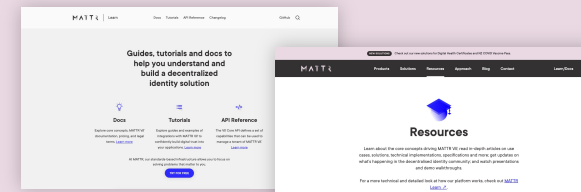**To learn more, reach out for a discussion with our team or alternatively see our comprehensive resources:**
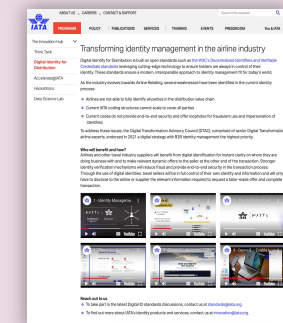
MATTR YouTube

youtube.com/mattrglobal

MATTR Learn -

IATA: Digital Identity for Distribution

Link

Learn.mattr.global

mattr.global/resources/

MATTR