



41st UN/CEFACT FORUM

2-5 OCTOBER 2023 | BANGKOK | THAILAND

Identifier Standardisation

Subjects and Objects

Discoverability, Resolvability, and Verifiability

Situation, Direction, Common Understanding

Identifiers: Data Linking Instruments

Identifiers are our instruments for recording and playing-back

Recording the Supply Chain



Designed by macrovector / Freepik

Playing back the Supply Chain

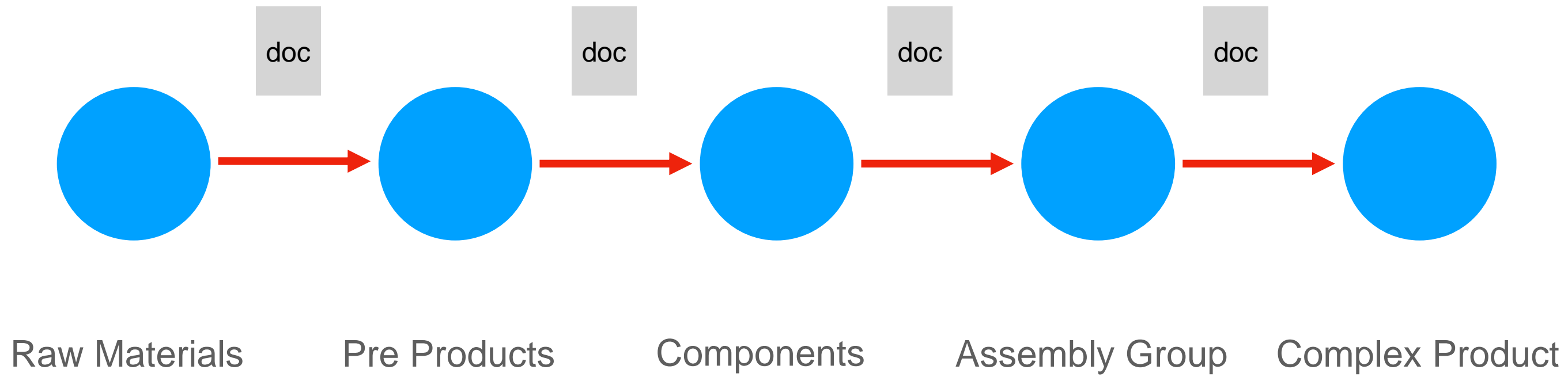


Designed by macrovector / Freepik

DATA PUSH vs PULL

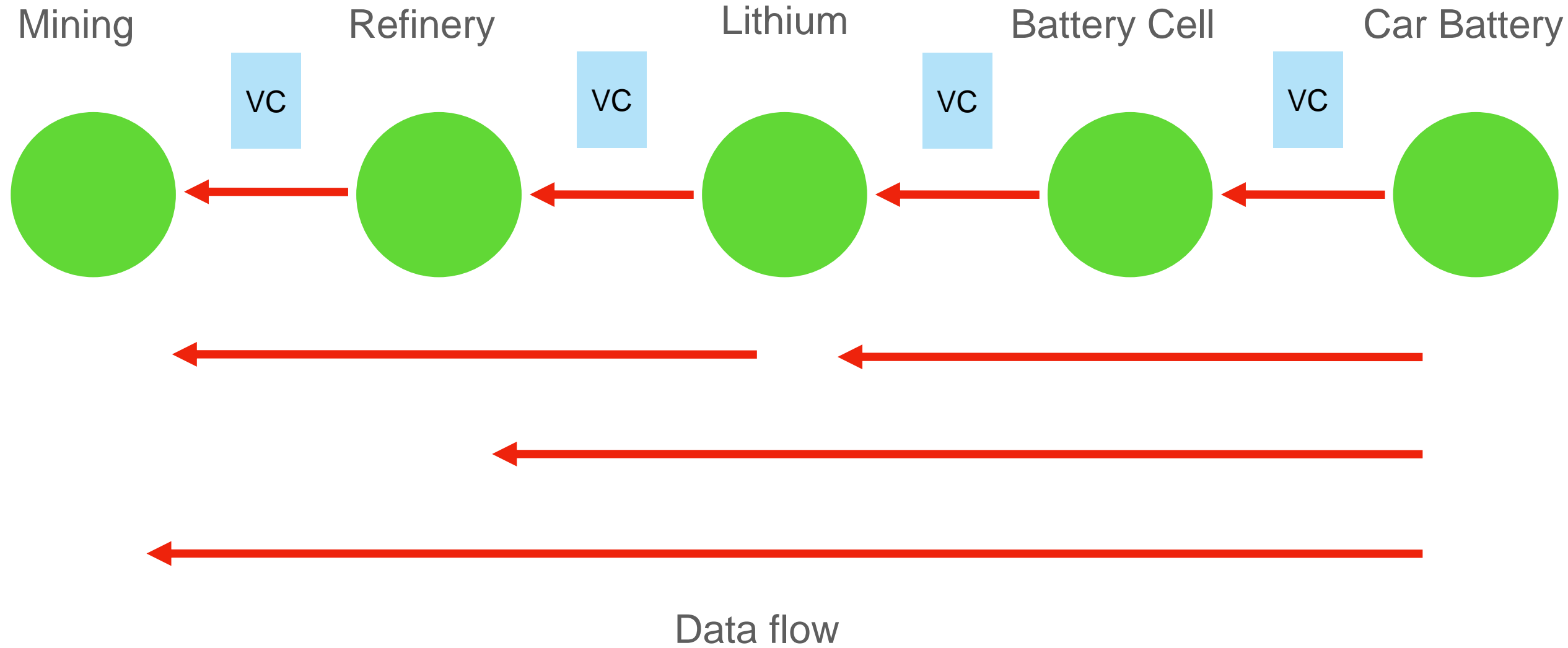
From Push to Pull in the supply chain information layer

TODAY



Data being **pushed** along the supply chains from silo to silo

TOMORROW



Data will be **pulled** by supply chain participants as required for their purposes

Functions of Identifiers

What identifiers should do for us



To say who somebody (Subject) or what something (Object) is.



To provide a path to data about that Someone or Something.



To allow retrieval of data attributes for the identified Subject/Object.



To obtain proof of the data's originator, it's provenance.

Requirements to/for identifiers

Data tracing, retrieving, checking

- Discoverability

Where to find the data?

- let me find the location of the data behind the identifier!

- Resolvability

How to retrieve the data?

- let me have the data behind the identifier!

- Verifiability

Who recorded the data?

- prove the data's origin, its creator to be genuine!

Supply Chain Recording

Who **deals** with whom about what?



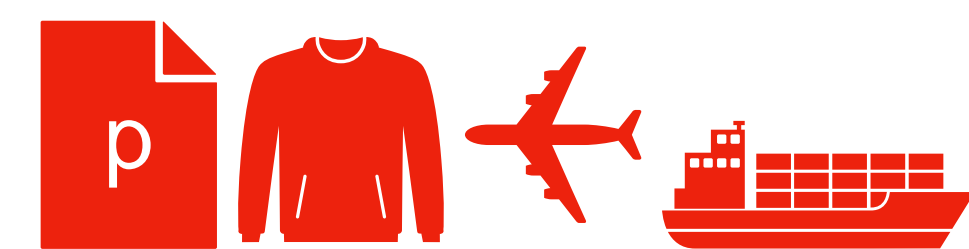
linking

the

objects

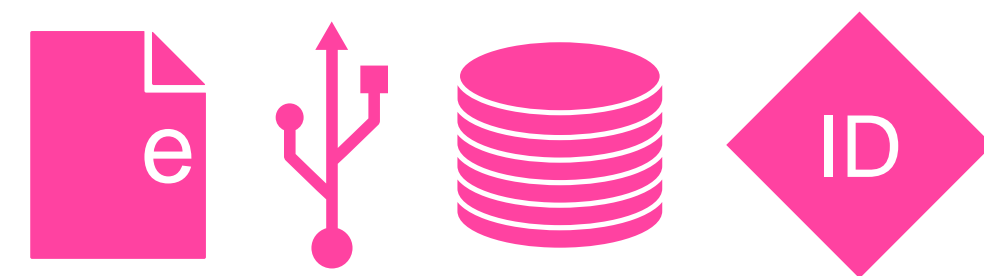
and the

subjects



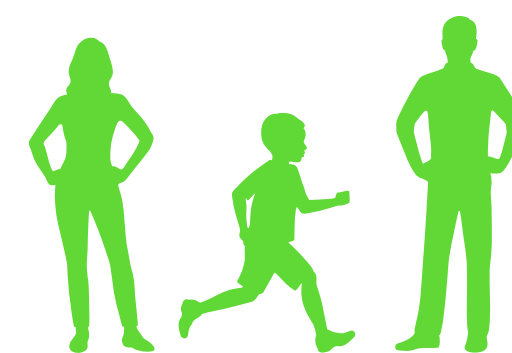
material

immaterial



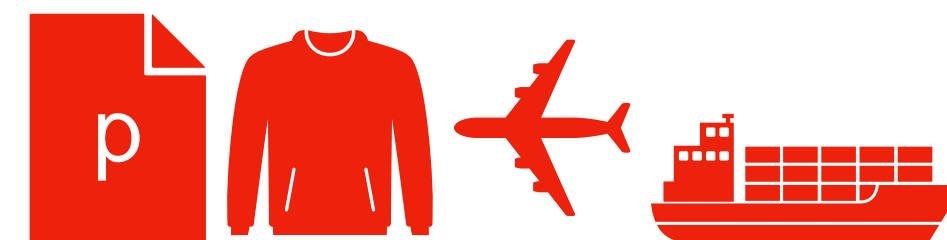
legal entity

natural person



Supply Chain Recording

Who **dealt** with whom about what?



material

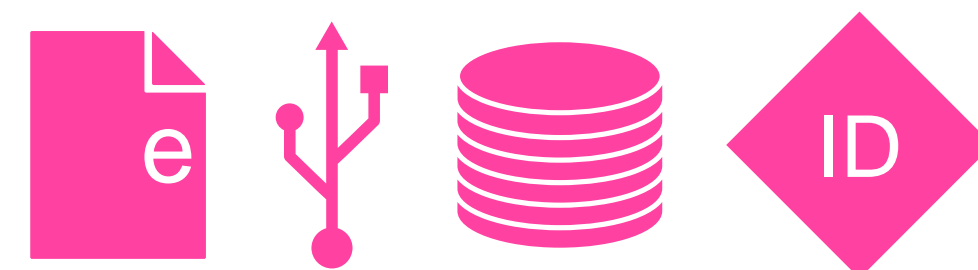
linking the **objects** and the **subjects**



legal entity

immaterial

natural person





Subject Identifiers for Legal Entities

We, **Trade Co. [S:LE]**, exclusively control the electronic Bill of Lading **[O:Imt]** of consignment XYZ **[O:Imt]** pertaining to shipment ABC **[O:Mat]**.

We are putting it to the order of **Bangkok Bank [S:LE]** for them to become the successor in exclusive control.

Payment 1a2b3c **[O:Imt]** pertaining to consignment XYZ **[O:Imt]** has been made by us, **Trade Co. [S:LE]**, beneficiary being **Sell Ltd. [S:LE]**

We, **Sell Ltd. [S:LE]** are certified by **Cert Org [S:LE]** as a Known Consignor **[O:Imt]** to pack ULDs **[O:Mat]** for air cargo and issue Consignment Security Declarations **[O:Imt]** and Dangerous Goods Declarations. Dan Diligent **[S:NP]** is also certified to have the required knowledge by **Cert Org [S:LE]**

Where to find data on Sell Ltd.? Can I feed it in my systems? Is it genuine?



Discoverability



Resolvability



Verifiability



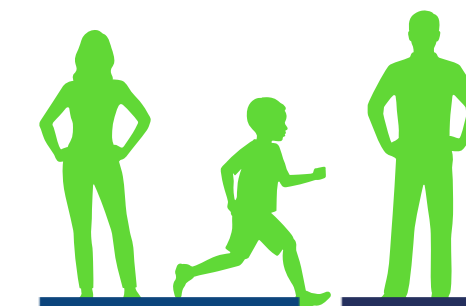
Subject Identifiers for Legal Entities

- S&P
- DUNS
- LEI
- ...
- National VAT Reg. Nr.
- Nat. Business Reg. Nr.
- EORI Nr.
- ...
- AEO Nr.
- REX Nr.
- Antidumping Code
- ...

Many different schemes!
Many different data models!
Many different end points!
No verifiability!

Standards?

Standards seem required for
pull based supply chains



Subject Identifiers for Natural Persons

- Personal identity has many scopes.
- For trade facilitation the scope of highest interest should be
 - [1] the role as a consumer
 - [2] the role of an employee
 - [3] Official roles

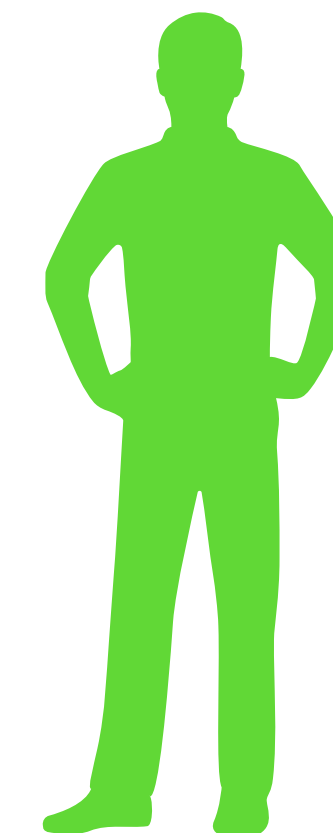


Public, Social Networks



Friends

Family



Official Roles

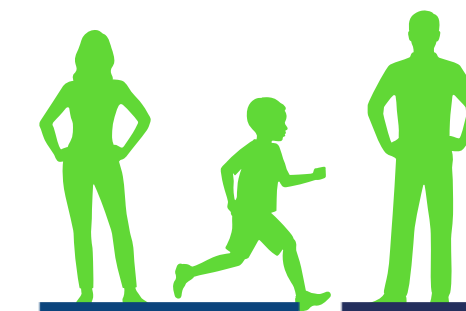


Consumer

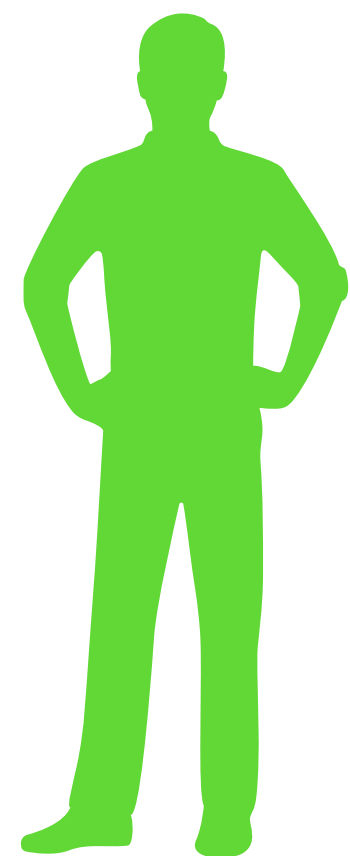


Employee (1-n)





Subject Identifiers for Natural Persons



Consumer



- Which attributes to reveal to an online shop?
- How to provide proof of authority to buy alcohol
- How to prove authority to accept e-commerce shipments (for my neighbour)

- Dear Online Shop, here is proof I have paid. Handover the shipments to Logservice, they know who I am and where I live. That's all you need to know to deliver the wine.
- Here is redacted VC presentation of my Government issued ID. I am 21+ years old.
- Here you are a delegation of authority to deliver to my neighbour.

Employee



- In which capacity am I working for Employer Co.?
- Which business processes am I eligible to partake in and sign off on? Also on behalf of my colleague.
- What applications am I assuming which role in?

- I am Dangerous Goods Safety Advisor
- I can accept delivery of Dangerous Goods
- I have access to WMS in role DGSA

Official Roles

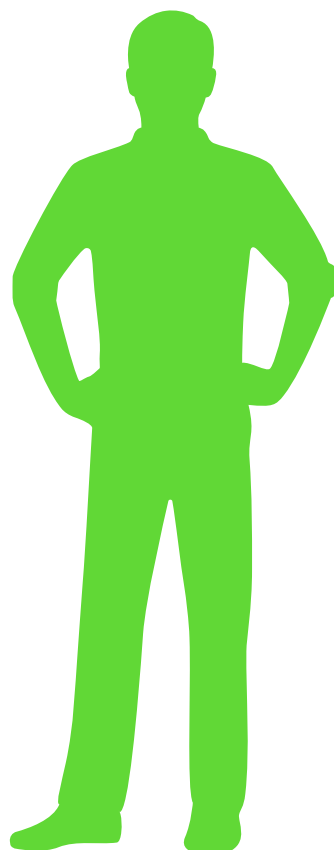


- In which capacity am I working for Employer Co.?
- Who signed the annual report?
- Am I shareholder in Employer Co.?

- I am the CEO of Employer Co.
- I have verifiably signed the annual report
- Yes, I verifiably am, dear tax man!



Subject Identifiers for Natural Persons



Consumer



Discover
Resolve
Verify

Acknowledging receipt of an eCommerce shipment

D: Present and let the postman/delivery service challenge the DID used while shopping online
 R: Retrieving the engagement context authority of the person accepting an eCommerce shipment
 V: Verifying its a fit

Handing over the shipment! Accepting electronic signature on the delivery note

Employee



Discover
Resolve
Verify

Progressing business process steps

D: Receiving the DID of a counterparty employee, following the URI
 R: Retrieving a VC that shows the employment relation
 V: Verifying that the counterparty role is sufficient to proceed and issued by and Official Role.

Stepping ahead in the business process

Official Roles



Discover
Resolve
Verify

Delegating authority from an Office Holder to a holder of an engagement context role

Look up the DID of CEO
 Get the employee's VC, look up the signature
 Check against the VC of the Office Holder

Act!



Identifiers for Immaterial Objects

Examples

- Electronic Trade Documentation
- Software instance
- Identifiers
- Data
- Consignments

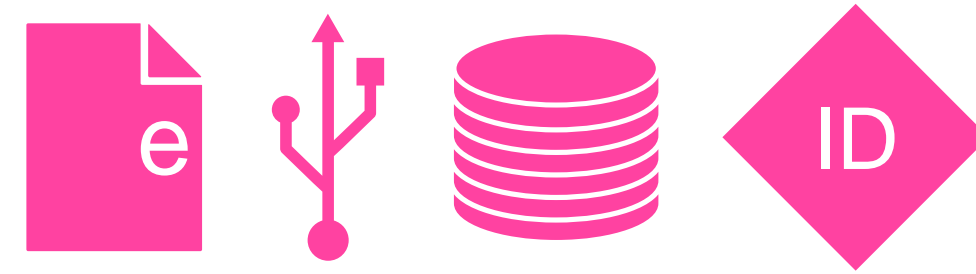
Delivery note and attributes required downstream

Bill of Lading - Bill of Lading transfer of control

A software running on an IoT device

A data table allowing for mapping of something

This is a very broad field - almost infinite!
Can standards be conceived to achieve discoverability, resolvability and verifiability of Identifiers for Immaterial Objects?
Are general recommendations useful?

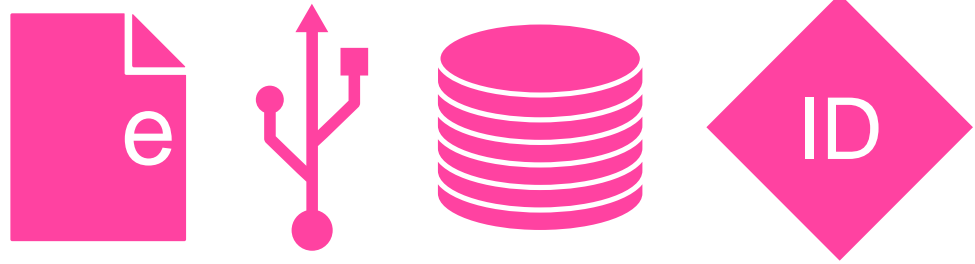


Identifiers for Immaterial Objects

- **Software instance running on devices**
IoT device initiating a session with a port system



O:Imt related to O:Mat



Identifiers for Immaterial Objects

- **Software instance running on devices**
IoT device initiating a session with a port system



A ship's infrastructure talking to a container



A container talking to a port's crane



A port's crane talking to a truck being loaded



O:Mat



Identifiers for Material Objects

Examples

- Container → **Container** data on
 - Type (bulk, reefer ...)
 - Type of IoT device
 - age
 - cycles, last maintenance
 - ...
- Palette
- Vessel
- Locations → **GLN** address of location to
 - delivery management system
 - route planning system
 - navigation system of the truck driver
 - being part of a Bill of Lading
 - ...
- Data
- Shipment
- ...



Discoverability



Resolvability



Verifiability

Identifiers can replace data held in systems

...in case data is resolvable at any time

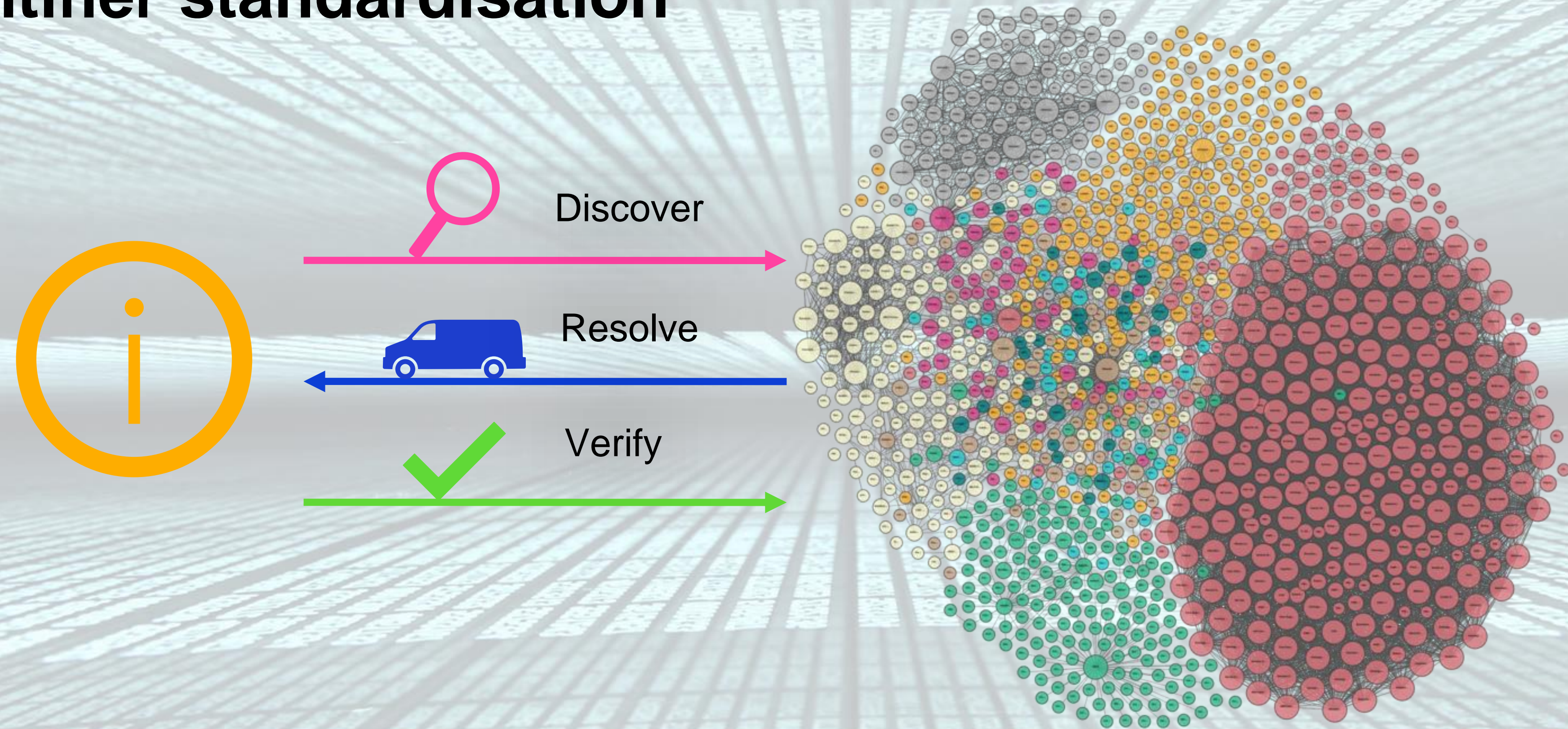
KENYA PLANT HEALTH INSP PHYTOSANITAR Agricultural Produce (
1. Name and address of exporter PHANTASY TEA OF KENYA LTD. P.O.Box 20233- GPO 00100,NAIROBI Kenya	2. PHYTOSANITARY CERTIFICATE No. KEPHI
3. Declared name and address of consignee LORDS OF TEAGATE LTD. PLUMPTON HSE, YORKSHIRE PARK NORTHGATE, SHIREYORK, +44 (0) 2314 814040, DG2 7LH United Kingdom	4. To Plant Production Organization of United Kingdom
5. Place of Origin Kenya	6. Declared point of entry By Sea
7. Declared point of entry TEESPORT	8. Distir CAAU
9. Number and Description of packages: 440 Packages of 24200.00 Kgs.	10. Name of plants Tea.
11. Botanical name of plants	12. Quantity declared 440000.00 Kgs.

- https://search.AEOglobal.org/Kenya/KE-AEO_12345678 still fiction
- <https://search.gleif.org/#/record/9845003FN9B385F3CE87> already fact

Identifier Properties

and one goal of identifier standardisation

- **Discoverability**
where is the data?
- **Resolvability**
how can I retrieve the data?
- **Verifiability**
who is the data's originator?

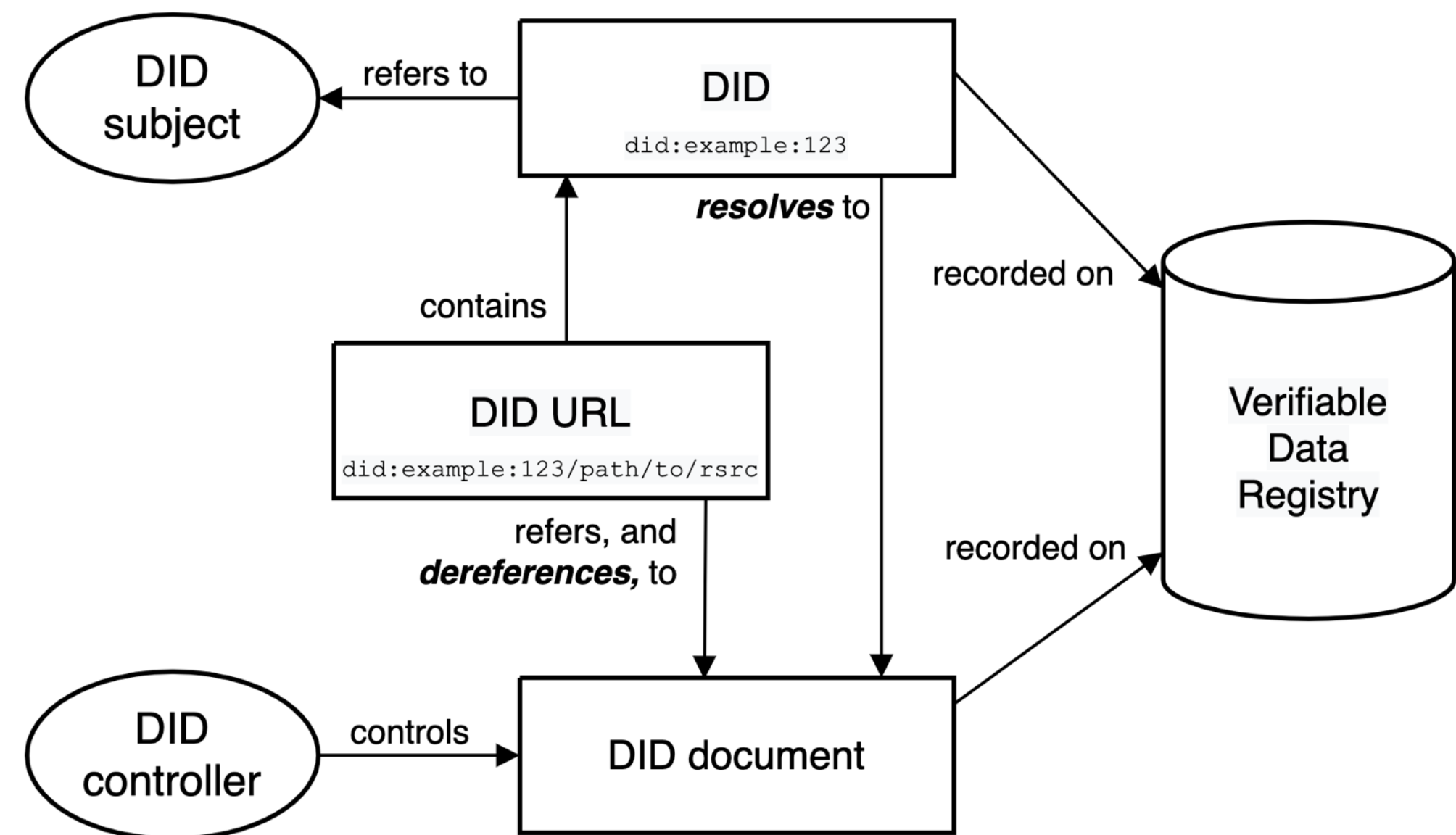


Discoverability

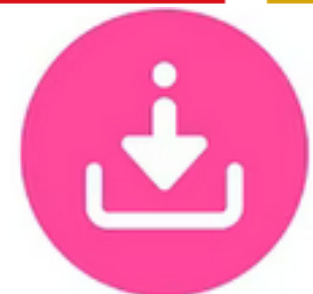


Will W3C's DIDs do it?

- What are the requirements of trade & trade facilitation?
- Is the W3C DID standard conducive for trade facilitation

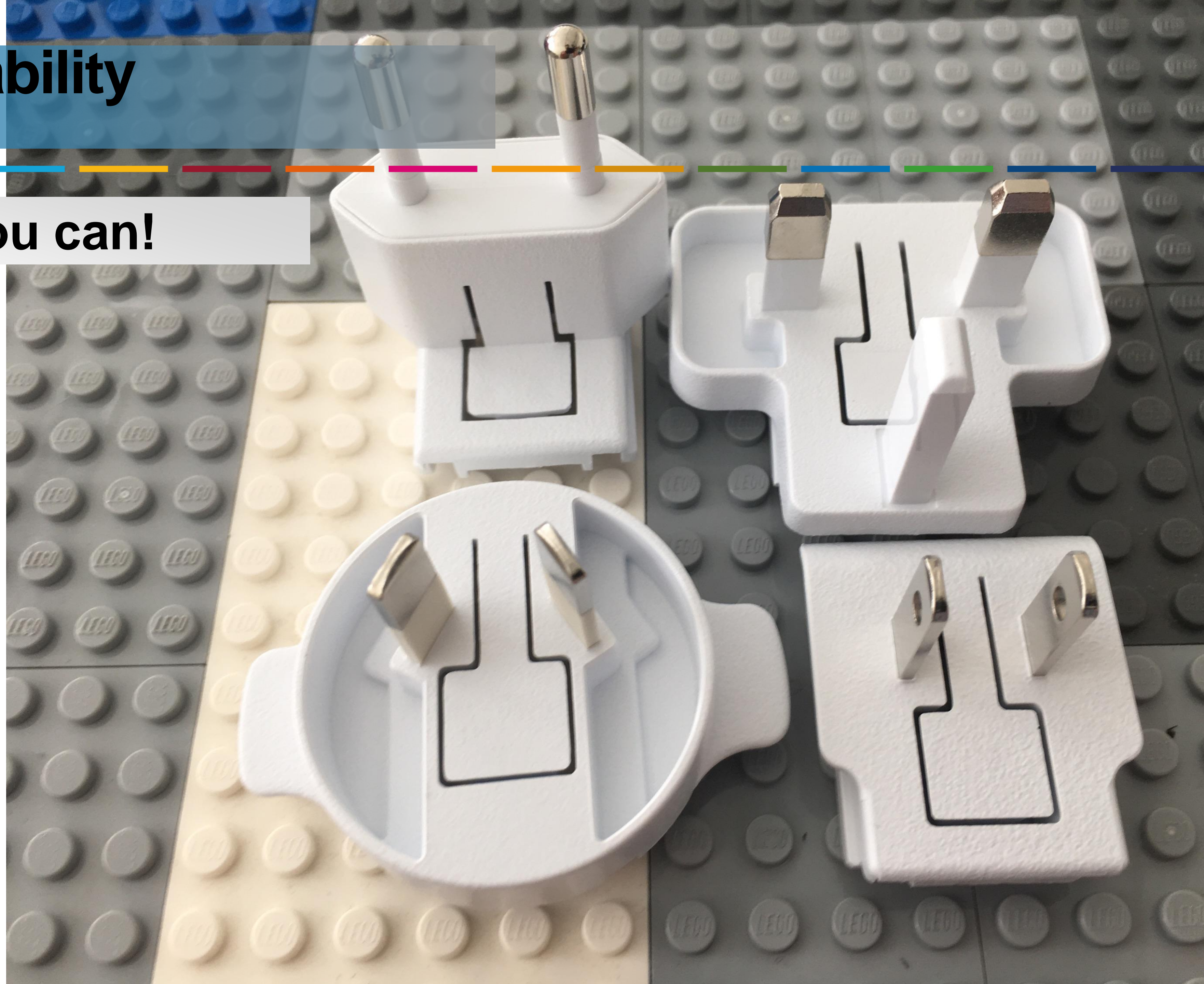


Resolvability



get the data, if you can!

- Which standards are conducive to allow easy retrieval of data?
- What will the governance look like?



Verifiability



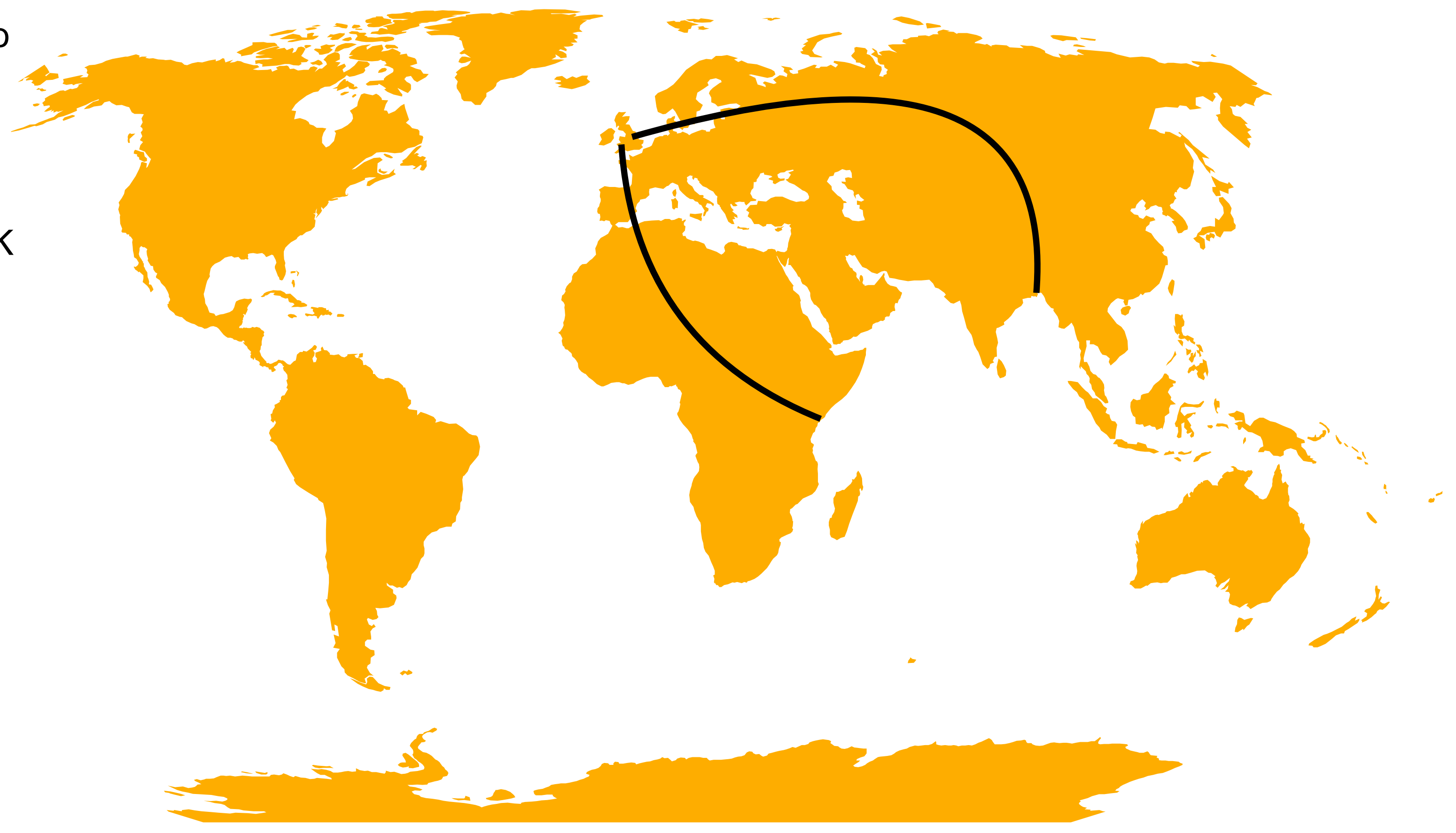
Who produced the data?

- How to know who produced the data delivered?
- What Identifier to use for that Who?
- Will verifiability persist in the course of the data roaming through systems?
- What changes to systems are to be expected and considered?
- What is the relation to Zero Trust Architecture?

Case 1: Importing into the UK (and elsewhere)

Identifiers to alleviate customs proceedings

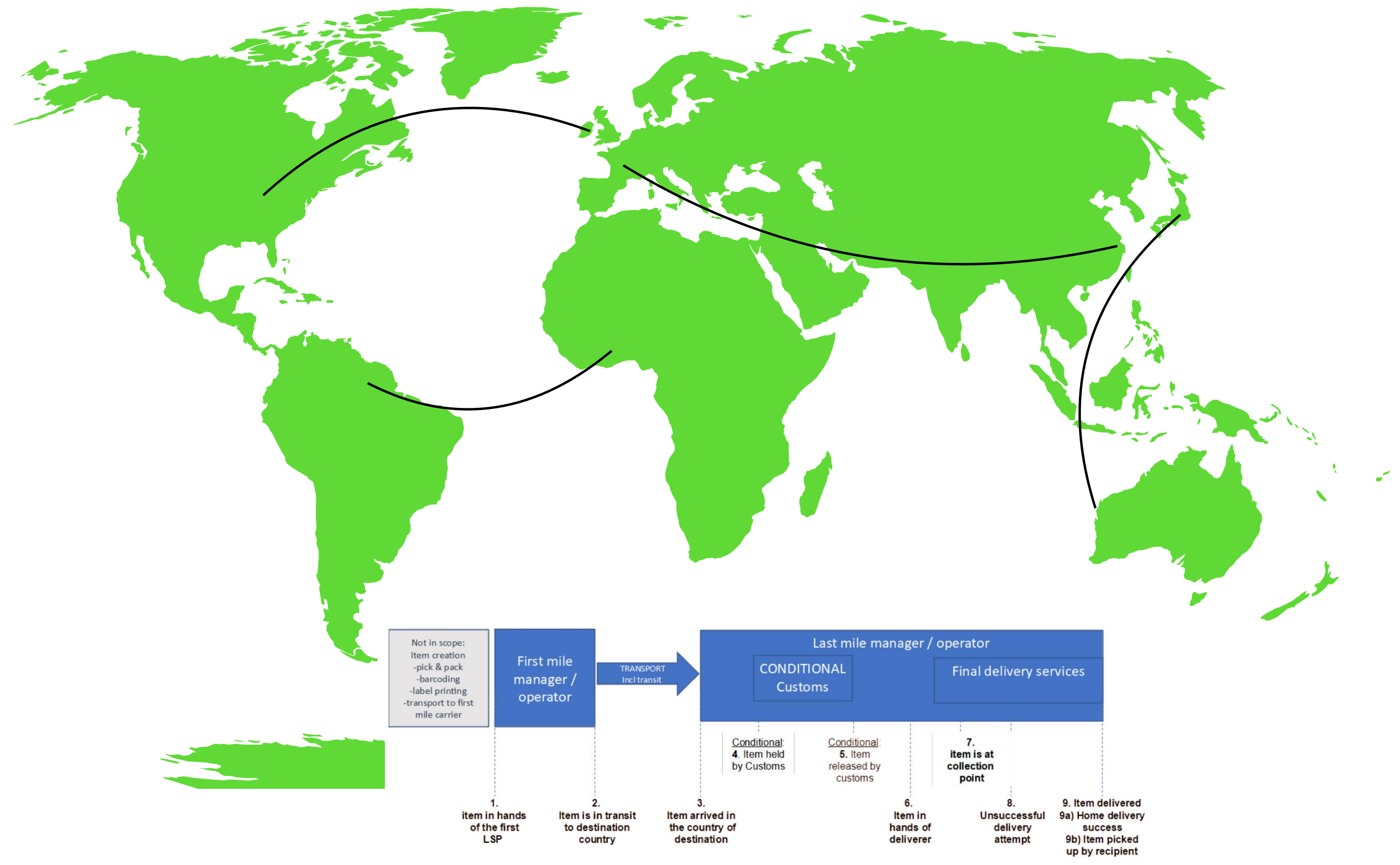
- UK HM Revenue & Customs desires to have early insights into the delivery pipelines to conduct advance risk assessment
- Who delivers what by when into the UK
- Importers and Exporters desire de-complicating the process of Identification of Legal Entities.
- Importing tea from Keya and Apparel from Bangladesh



Case 2: Tracking eCommerce Consignments

Harmonised T&T Events and Identifiers

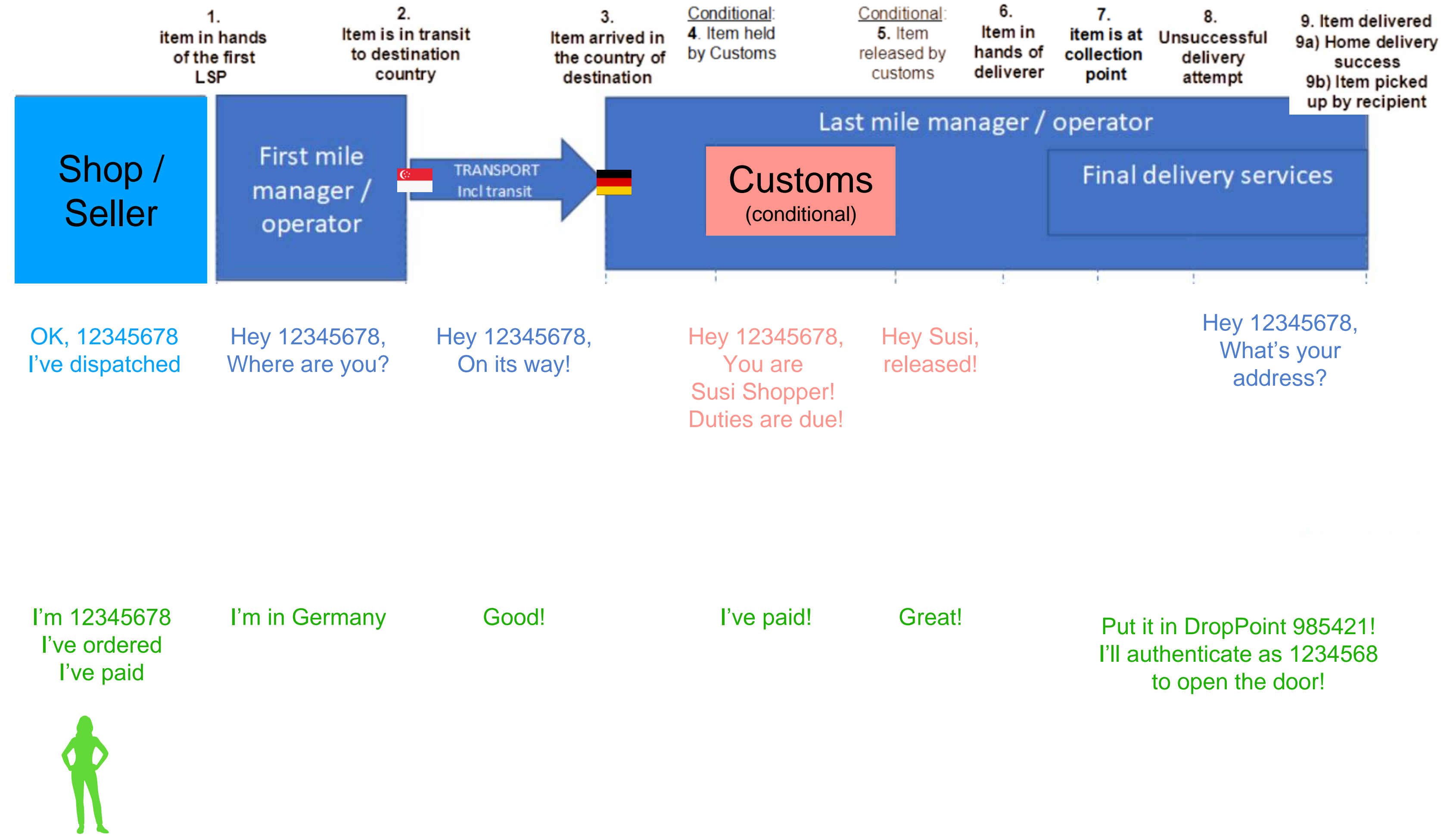
- Customers desire insights into the delivery process of their eCommerce orderings
- Customs and tax authorities want insights into the ever more increasing flows.
Who owes duties and tax by when?
- **Harmonised events** in the eCommerce delivery chains will allow to relate identifiers to it, i.e. for Companies, Persons, Consignments, Shipment, Products, etc.
- Which extent of identifier standardisation is conducive to help this case



Tracking eCommerce Consignments

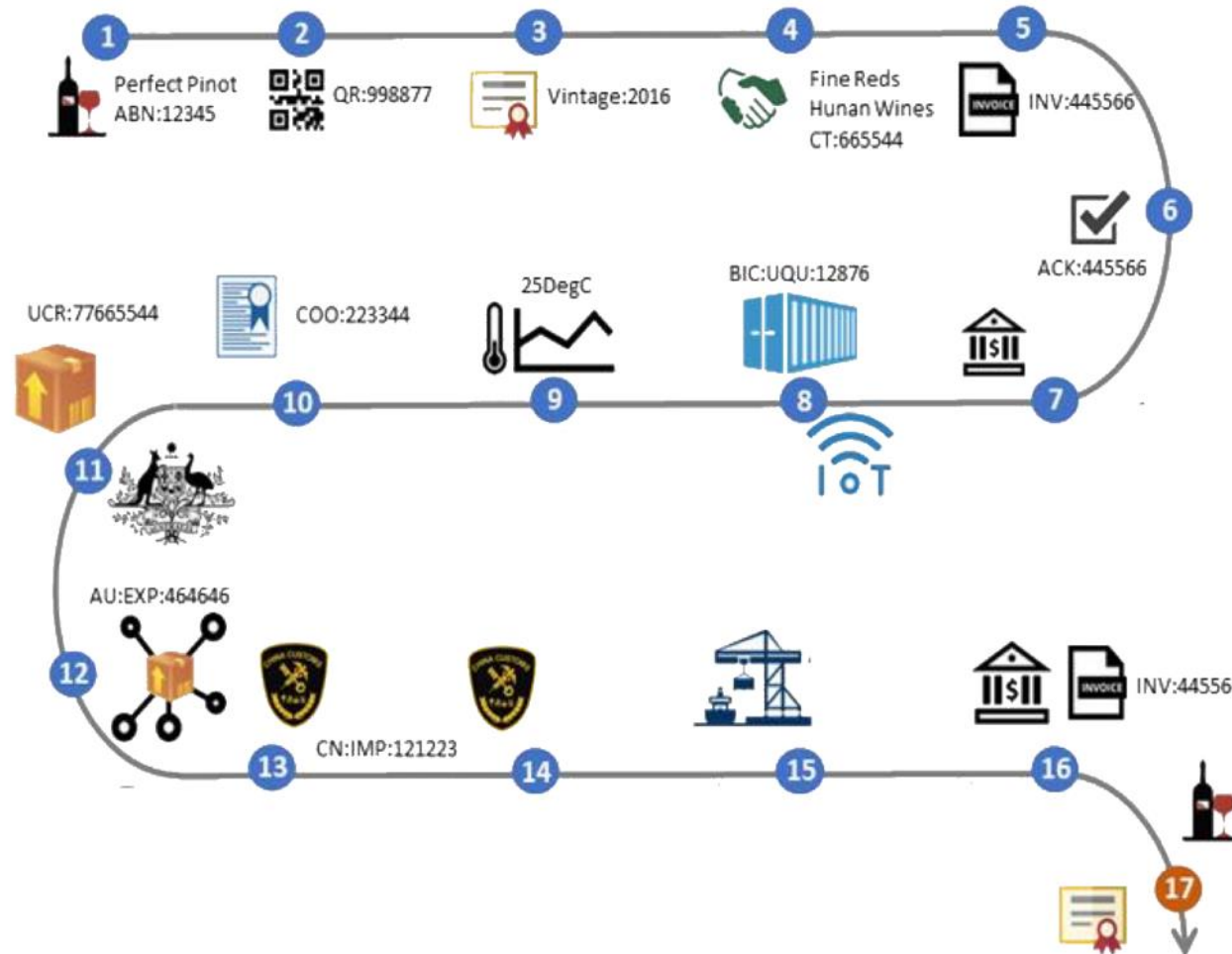
Harmonised T&T Events and Identifiers

- Customers desire insights into the delivery process of their eCommerce orderings
- Customers may desire more data sovereignty
- Customs and Tax Authorities desire insights into the ever bigger flows
- Harmonized events in the eCommerce delivery chains allow interrelating S:NP identifiers (Customer) or S:LE identifiers (Customer) to identifiers for O:Imat (Consignment; Event) and O:Mat (Shipment)
- This allows for a data pull approach, rather than pushing information onwards
- Selective disclosure of credential attributes allows for data sovereignty



Perfect Pinot's Fine Wine of 2019

- Buyer of a product wants certainty on the transport conditions remaining beneficial to the product
- Consumer of a product wants assertions around the product to be true. (Genuine, Organic, etc...)
- Financial Service provider trading off margin against better risk assessment
- How do identifiers ease the availability of the required data?
- How to make it verifiable?



How to proceed?



Deliver Whitepaper on S-O-S relations first

S-O-S Whitepaper

- Explain how identifiers form Subject-Object-Subject relations in supply chains
- Discuss Discoverability, Resolvability and Verifiability
- Demonstrate S-O-S relations in several trade case and selected use cases
- Prepare the consequential work by introduction of examples for later reference.

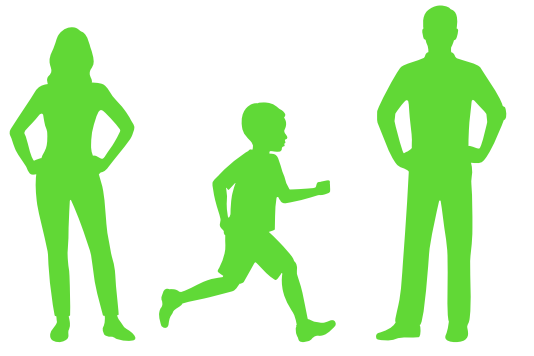
How to proceed?



Work on Identifiers for Legal Entities

1. Standardize all global identifiers for LE, recommend how to make them verifiable. Identify actions conducive to increasing global interoperability for sovereign identifiers, list and categorise desired standardisation dimensions
2. Discuss standardisation of global identifiers and mapping of sovereign/local /sectoral (path 2) between global and sovereign/local /sectoral schemes
3. Outline a potential synthesis between path 1 and path 2

How to proceed?



Work on Identifiers for Natural Persons

Consumer



- How do the two roles Employee and Official Role contribute to Organisational Identity?

Employee



- Which impact will externally verifiable roles of employees have on IAM systems. Effect for trade?

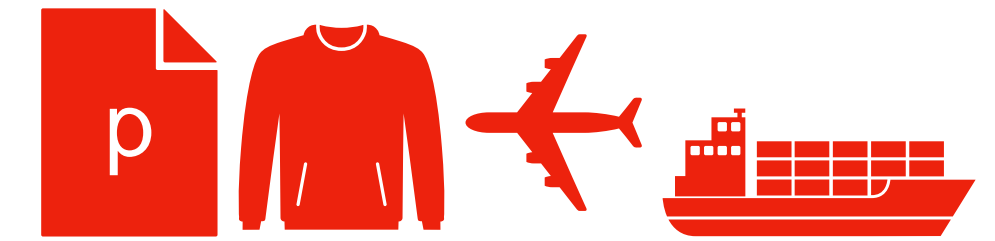
- What relations will have to be considered?
P2P, P2G, P2B.consumer, P2B.employee...

Official Roles



- What are the change drivers for trade facilitation
What are the opportunities

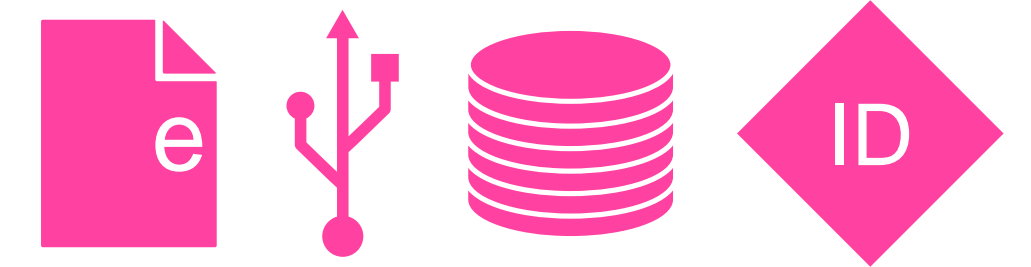
How to proceed?



Work on Identifiers for Material Objects

- What are the benefits of Discoverability, Resolvability and Verifiability of Identifiers for Material Objects in Supply Chain Graphs.
- Are there commonalities between the various different Material Objects
- What changes to the CCL are foreseeable?

How to proceed?



Work on Identifiers for Immaterial Objects

- What are the benefits of Discoverability, Resolvability and Verifiability of Identifiers for Immaterial Objects in Supply Chain Graphs.
- Are there commonalities between the various different Immaterial Objects
- What changes to the CCL are foreseeable?



41st UN/CEFACT FORUM

2-5 OCTOBER 2023 | BANGKOK | THAILAND

Thank you!