Inter-government Ledger

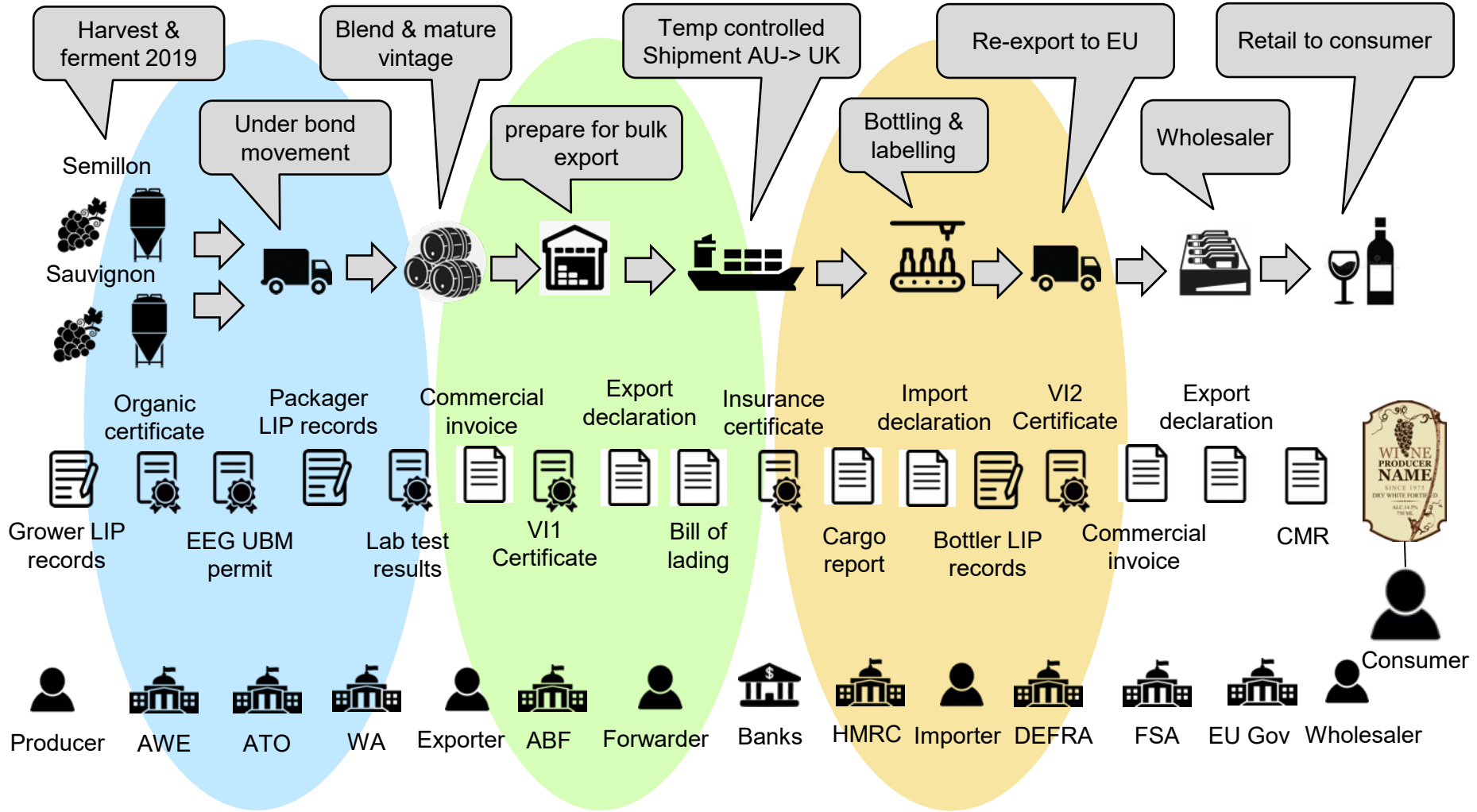
A journey from paper to decentralized trust and what it means for our project.

UN / CEFACT

- Geneva virtual forum 11 Oct 2021

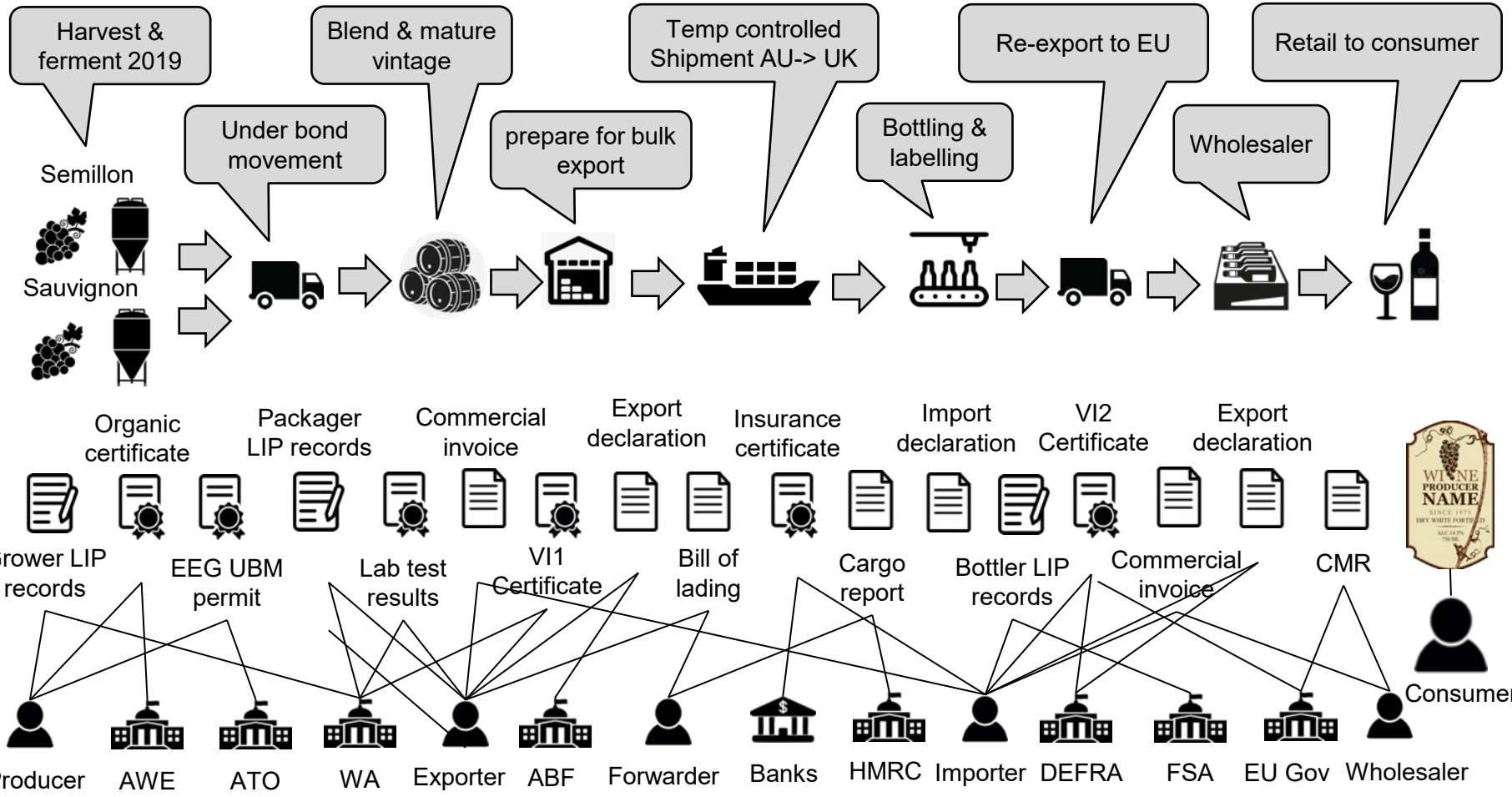
A typical wine pathway

Barossa Valley Organic Semillon Sauvignon 2019 vintage -> UK -> EU



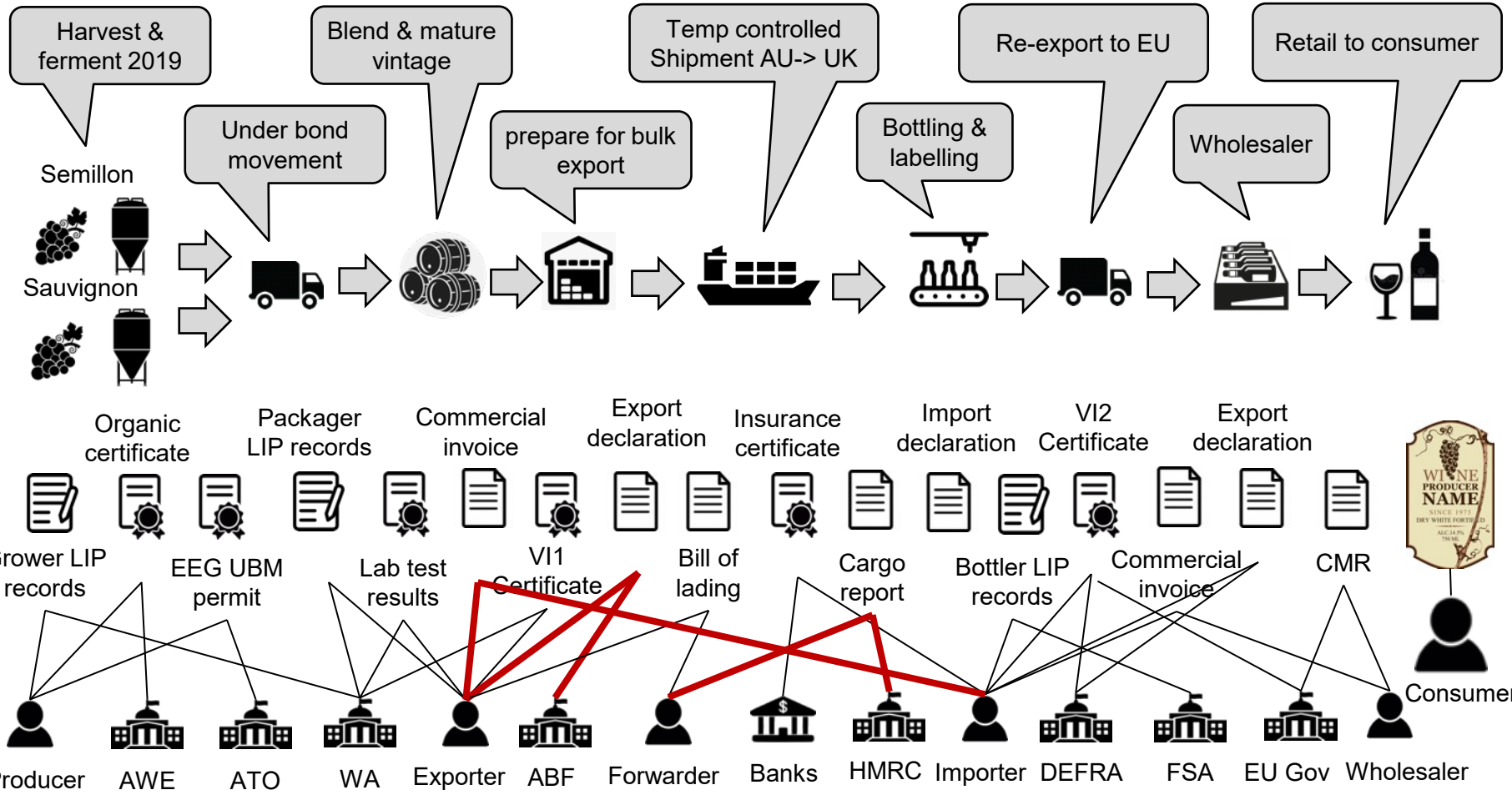
A typical wine pathway – paper world

Complex and costly paperwork – inefficient, poor transparency, risk of fraud.



The pathway – with some EDI

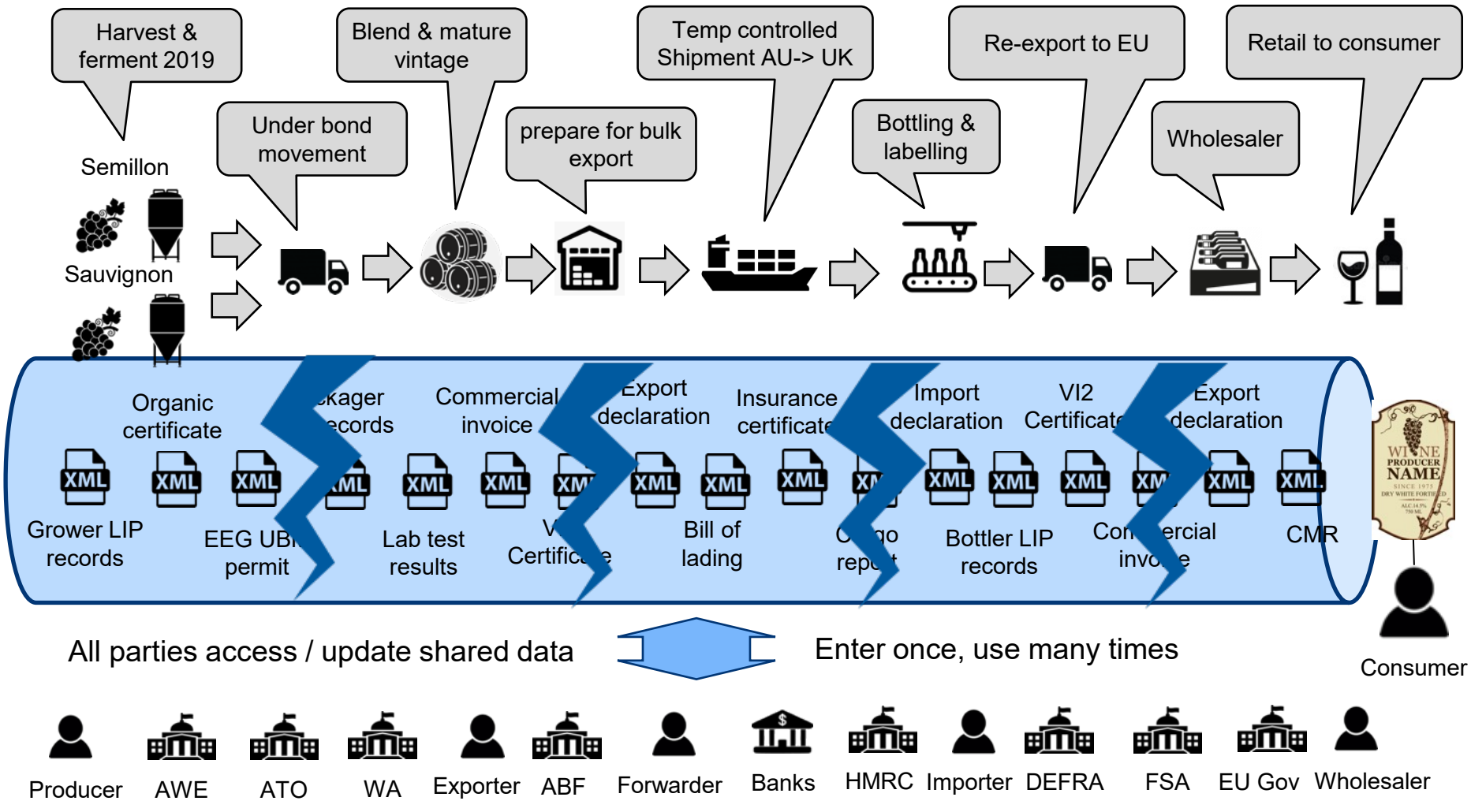
Traditional EDI (whether EDIFACT, XML, or JSON) is only feasible at volume.



Maybe a few parties will build a few B2B/B2G interfaces for a few documents.

Pipelines are supposed to integrate more

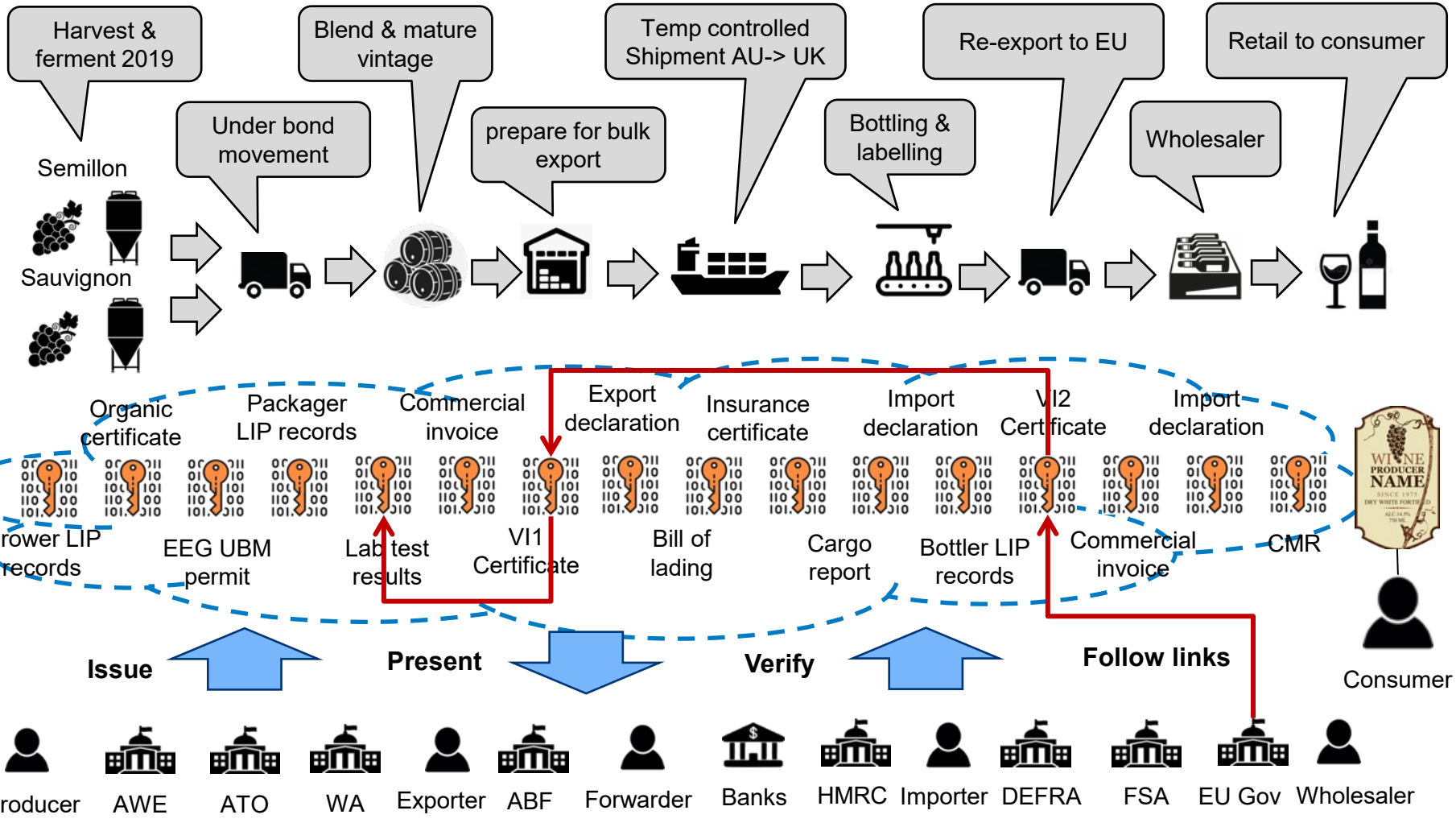
BUT no one pipeline will ever cover the entire supply chain – or even one consignment.



So these pipelines will never be commercially feasible

The decentralized “trust web” is better

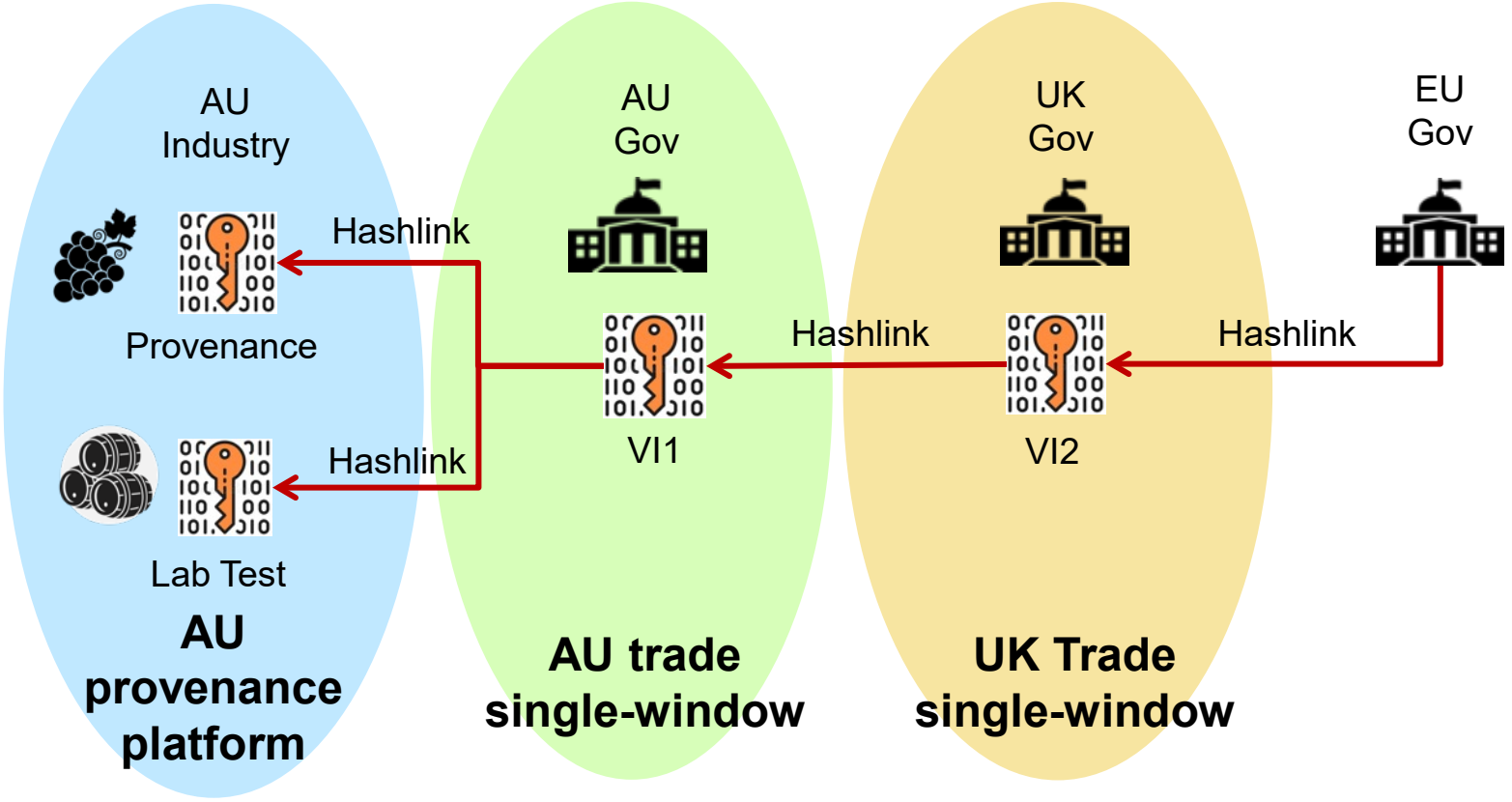
Each party issues / verifies linked digital credentials to holders. ***There is no hub***.



The most scalable, secure, and privacy maintaining model

So digitization could look more like this

What matters is the digital (verifiable) document, not the transport.



Platforms / hubs still exist – but they service their functional / geographic domain – and credentials are the glue between them. In reality this scenario would also have port community systems, trade finance systems, etc

Which solves a pressing problem

Everyone wants to rule the world – and no-one will. This is how to coexist.

In just one issue of the land..

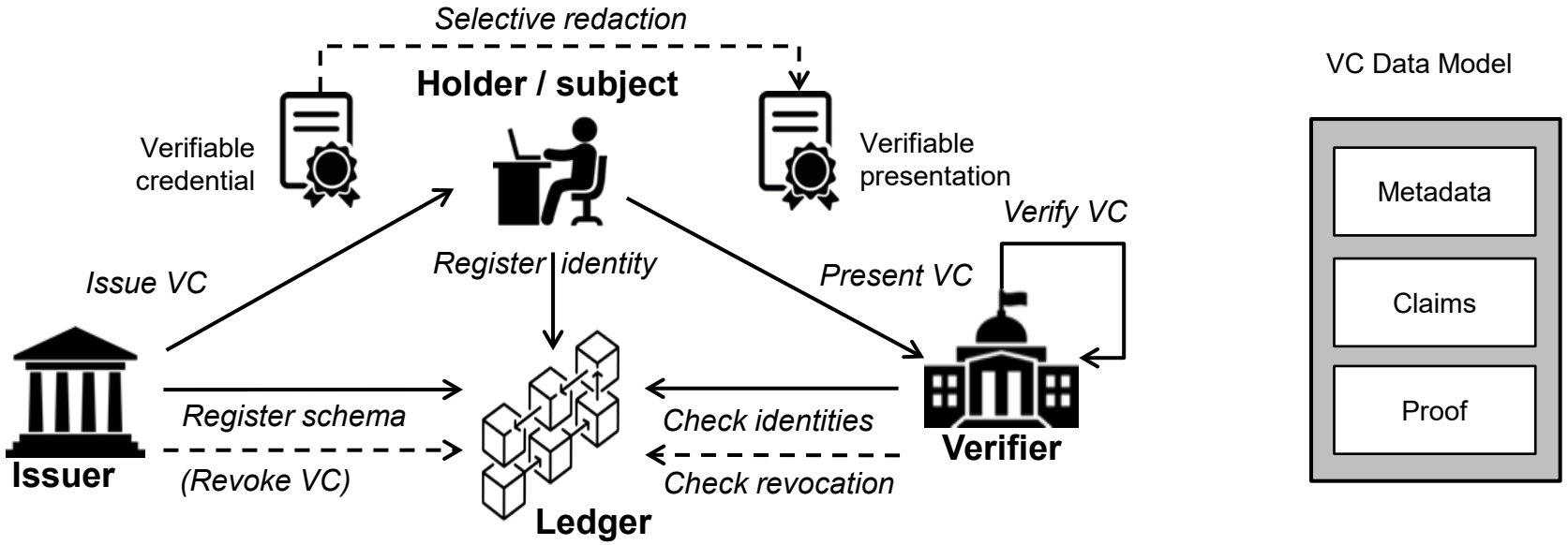
Ag-tech : monitoring

Ag-tech : sustainability

Ag-tech : traceability

Sharing data as VCs solves the problem

And what is a Verifiable Credential?



A VC is a privacy-preserving digital document that contains a set of claims (eg “has BSc in engineering”) about a subject (eg “john smith”) made by an issuer (eg “Oxford University”) together with a proof (eg digital signature) linked to the issuer identity. VCs are decentralised - each holder keeps their own data without any need for centralised data stores.

Standard https://www.w3.org/TR/vc-data-model/

Use Cases https://www.w3.org/TR/vc-use-cases/

And why are they important?

- Tamper proof : Impossible to change without invalidating the document.
- Identity linked : Strongly linked to the identity of issuer and subject (eg trader)
- Revocable : Revoked documents will show as invalid even after issue.
- Redactable : Holder can redact private or commercially sensitive data.
- Verifiable : By any party even if unknown to the issuer.
- Automatable : high volume verifiers can automate verification & ingest full data
- Interoperable : even with millions of independent issuers & verifiers
- Secure : from all plausible attack vectors & ASD ISM/cyber compliant.
- Cost effective : No shared infrastructure needed.

Analogy – like the chip in your passport, a VC allows any human readable document to embed a digitally verifiable proof of integrity.

Here's an example…

AU – SG CoO using OA Protocol

Open attestation (OA) Adds a few useful extensions to the basic VC framework for the cross border trade use case.

- PDF compatible: One time secret embedded in QR code allows secure storage of the original data that is still accessible by any verifier to which the QR enabled PDF is presented. This means:
  - Existing supply chain processes can continue, just swap the paper “original” for a PDF with QR.
  - Any verifier can confirm integrity just by scanning the QR.
  - Mature verifiers can still retrieve and process the underlying digital data and proofs.

Scan me!

- Batch notarisation: Open Attestation depends on the Ethereum public ledger and each transaction costs about $1. Batching allows 1000’s be be notarised with a single blockchain transaction, reducing costs to near zero.
- Holder managed redaction: The holder of the open attestation can redact any data element without recourse to the issuer.

So what is the role for UN/CEFACT?

When there's thousands of issuers and millions of verifiers, all using their own preferred technology products, interoperability becomes CRITICAL

- US DHS is running "plug-fests" at the technical level to prove that a credential issued by technology tool A can be verified by technology tool B
- BUT what's even more important is that both issuer and verifier understand the semantics of the claims in the credential. This is the role for UN/CEFACT.

Verifiable credentials use JSON-LD to specify the meaning of the data in the credential.

Just like the way https://schema.org defines web semantics that bring consistency to google searches, so UN/CEFACT should define trade semantics in JSON-LD. Good news is there is a draft.

- https://service.unece.org/trade/uncefact/vocabulary/uncefact/

The other thing we should do is write all this up as guidance for national regulators to help them implement. **That's this project purpose.**