Verifiable Credentials and Cross-Border Trade with TradeTrust and OpenAttestation

W3C TPAC 2023
IMDA and GovTech

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• Background
• OpenAttestation
• Digitalising Cross-Border Trade Documents with TradeTrust
• TradeTrust Demo
• Q&A
What is OpenAttestation?

• OpenAttestation is an open-source document endorsement and verification framework created by GovTech in 2018
Status

• At version 3.0, and on GitHub
• More than 10M verification collectively globally in 2022
Top 35 Countries by Verifications

Afghanistan
Australia
Bangladesh
Cambodia
Canada
China
France
Germany
Greece
Hong Kong
India
Indonesia
Ireland
Italy
Japan
Malaysia
Maldives
Myanmar (Burma)
Nepal
Netherlands
New Zealand
Philippines
Qatar
Saudi Arabia
South Korea
Spain
Sri Lanka
Sweden
Switzerland
Thailand
Turkey
United Arab Emirates
United Kingdom
United States
Vietnam

Source: GovTech Singapore • Created with Datawrapper
Digitalising Cross-Border Trade Documents with TradeTrust
The challenges of cross-border trade documentation and the benefits of digitalisation

**Complexity of Cross-Border Trade**

- Many parties across different sectors
- Many exchanges of information
- Many silo systems
- Up to 50 sheets of paper, exchanged up to 30 different stakeholders

**Inefficient**
- Manual handling
- Vulnerable to fraud

**Fragmented Systems**
- Costly connections
- No interoperability

**Shipping Cost**
- Cost of documentation is 20%* of cost of shipping
- This inefficiency is costly

**Benefits of Digitalisation**

- Direct Costs Saving
- Indirect Benefit to Shipping Ecosystem
- New Global Trade through adoption of eBL in international trade

*Maersk and IBM’s Paper Trail Research in 2014
^McKinsey Study “The multi-billion-dollar paper jam: Unlocking trade by digitalizing documentation” in 2022
Why hasn’t trade digitalisation taken off

Existential Symptoms and Issues to Digitalisation

Lack of Trust
- Transactions between companies with limited touchpoints
- Companies forced to adopt paper as the most interoperable medium but struggle with determining authenticity and source of documents

Digital Maturity Varies Across the Cross-Border Trade Value Chain
- The entire ecosystem is at various stages of development
- If one part of the chain is paper, all other documents revert to paper

Siloed Digital Ecosystems
- Existing technology solutions and platforms are generally not interoperable
- Fractured ecosystem. Parties forced to choose one or multiple systems

Legal Uncertainty of Digital Transferrable Documents
- Until recently[^1], only paper Transferable Documents were legally valid under statute law
- Therefore, transfers of title ownership via such documents could not be performed electronically

[^1] Singapore’s 2021 amendment of its Electronic Transactions Act (ETA), one of the first few internationally, enables the creation and use of ETRs such as electronic Bills of Lading (eBLs), empowering practitioners to reap the benefits of digitalisation more easily.
Tradetrust’s 3 key functionalities: authenticity, source & title ownership for trade documents

TradeTrust is designed to provide industry the means to verify the authenticity and source of a document, as well as to create Electronic Transferable Records (ETRs) that are functionally equivalent\(^\text{^}\) to their paper versions (e.g. able to effect title transfers).

- **Uses Decentralised Identifiers (DID) and digital signatures to verify the source and authenticity of documents.**
- **Uses Blockchain to create Non-Fungible Tokens (NFTs) to represent title ownership and enable transfers from one party to the next.**

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\*Decentralized Identifiers (DID) are a new type of unique cryptographically verifiable identifiers that are designed to be decoupled from centralized registries, identity providers and certificate authorities.
What is TradeTrust

TradeTrust is a framework that comprises globally-accepted standards that connect governments and businesses to a public blockchain to enable trusted interoperability of electronic trade documents across digital platforms AND it is offered as a digital utility.

4 Key Components of TradeTrust

1. Legal Harmonisation
   Provide legal validity for electronic negotiable documents through compliance to MLETR requirements

2. Standards Development
   Develop international standards that TradeTrust complies to

3. Accreditation Framework
   Certify technical solutions meet the requirements of the law

4. Software Components
   A set of open-source software code that can easily integrate backend solutions to the TradeTrust network
TradeTrust’s Key Design Principles

- **Public Blockchain**
  No central governance authority

- **Data Off-Chain**
  Preserves data confidentiality

- **Payload Agnostic**
  No data format or standards restrictions

- **Open-Source**
  Full transparency for faster adoption

- **MLETR-Compliant**
  Meet the requirements of the law (for electronic negotiable documents)

TradeTrust also aligns with the 9 Principles of Digital Development - [https://digitalprinciples.org/](https://digitalprinciples.org/)
Verifiable documents’ interoperability

1. Apply for CO
2. Generates digitally signed CO (TradeTrust document) and issues the CO to Exporter
3. Forward digitally-signed CO and other trade documents via conventional methods (e.g. as email attachment, file transfer, portal upload, data-sharing platform, API, etc.)
4. Verifies (automated or manual) digitally-signed CO with Issuer’s DID
5. Submit Import Declaration and provide digitally-signed CO and other supporting documents (TradeTrust documents or PDF)
6. Verifies digitally-signed CO and extracts data from TradeTrust documents for automated processing

Public Blockchain (TradeTrust network)

Key benefits of such a decentralized verifiable architecture are:
1. Removes the need for expensive data exchange infrastructure to be put in place in between exchanging parties.
2. Remove tight coupling and inter-dependencies between exchanging systems. This means exchanging parties can proceed to upgrade and make changes to their IT systems at their own pace according to their own priority.

For doc creation, no writing to blockchain = No gas fees!
Dealing with transferable documents (Bill of Lading as an example)

**Paper Transferable Instrument**

**Electronic Transferable Record**

**Title ownership**

**BL Data**

**Title ownership**

**BL Data**

(On Public Chain)

(On Business App Server)
Enabling transferable documents’ interoperability across different digital ecosystems
Typical pilot use case: cross-border trade financing involving eBLs

Using a public and permissionless blockchain network, TradeTrust enables all transacting parties such as Buyers, Sellers, Banks and Shipping Lines to validate and perform title transfers of eBLs that are commonly used in documentary trade financing (e.g. Letter of Credit) transactions, all in a decentralised manner.
20 pilots with industry partners and overseas governments

UK - Singapore
Ongoing

Abu Dhabi Global Markets - Singapore
Ongoing

Rotterdam, The Netherlands - Singapore
Jan 2021

Chongqing, China - Singapore
Ongoing

India – Singapore
Sep 2023
(Live Transaction)

Thailand - Singapore
May 2021

Singapore-Thailand
Feb 2023
(Live Transaction)

Beijing, China - Singapore
Ongoing

Japan - Philippines
Mar 2021

Suzhou, China - Singapore
June 2022

Zhejiang, China - Singapore
Apr 2022

Shenzhen, China - Singapore
Ongoing

Indonesia - USA
Apr 2022

South Africa - China
Invoice, Packing List, other digital docs
Nov 2019

India – Singapore
Sep 2023
(Live Transaction)

Singapore-Thailand
Feb 2023
(Live Transaction)

Australia Border Force – Singapore
Cert of Origin
Aug 2021

eBL related

non-eBL related
GLOBAL PARTNERSHIPS

ADGM

World’s first digital trade financing pilot between MLETR-harmonised jurisdictions

Media release
This is a joint media release between the Australian Border Force, IMDA Singapore and Singapore Customs.

Australia and Singapore’s blockchain trial shows promising results for reducing transaction costs

SWIFT and Singapore’s IMDA Join Forces to Drive Global Trade Digitalisation

Platform Providers
INTEREST FROM NOTABLE INSTITUTIONS GLOBALLY


www.wto.org/english/res_e/publications_e/wcotech22_e.htm

www.weforum.org/agenda/2017/02/blockchain-trade-trust-transparency

https://blockchainсылка


www.ft.com/content/3955046b-11ed-4720-8


world-trade-organization
Demo

• Redactable eBL
  o From a supplier, eBL can be reused for downstream supplier to its’ buyer.
• Renderer in this case is hosted by the original issuer.
• QR code allows a simple way to take part in the digital trade.
W3C Verifiable Credentials Interoperability

• V4.0: OpenAttestation data model to be compatible with W3C VC
• OpenAttestation proof method
• Decentralised Renderer
• Paper-Friendly Verifiable Credentials using QR Code
Wrap Up

• Make OpenAttestation and TradeTrust successful
• Participate in the W3C Verifiable Credentials Working Group
• Website: https://www.openattestation.com/
• GitHub: https://github.com/Open-Attestation
• Contact: openattestation_support@tech.gov.sg