IT INNOVATION FOR CUSTOMS; BLOCKCHAIN AND DATA ANALYTICS

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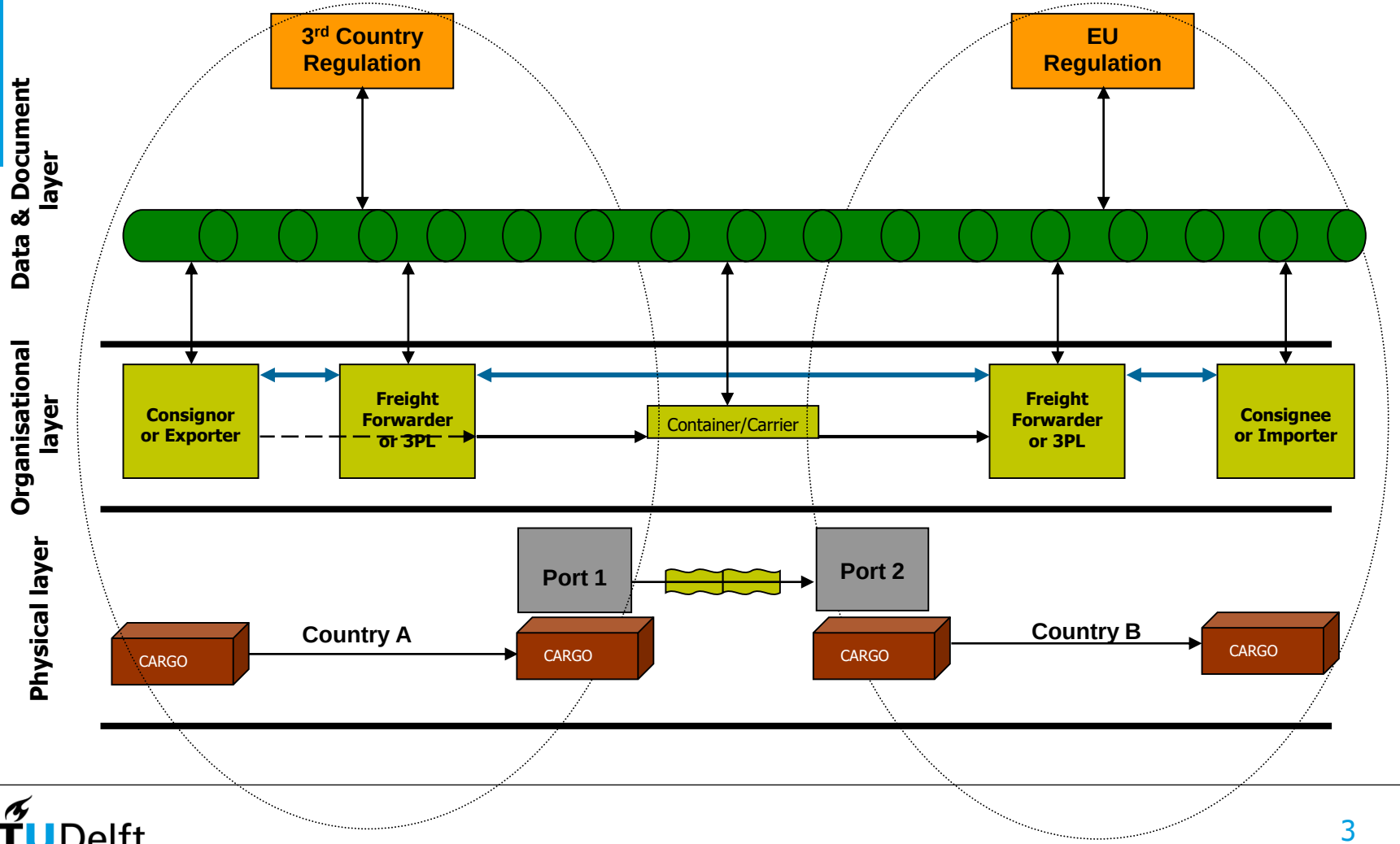
Why IT innovation is important

- E-Commerce leads to increase of customs declarations 15%/year
- Brexit leads to increase of customs declarations 15%/year
- Dutch Customs Example
  - 160M/year customs declarations (30% of total EU!)
  - Expected to increase to 500-600M/year in few years
  - Dutch declaration system AGS is tested for 1 Billion declarations/year
- Impossible to process this with current number of customs officers in the EU
  - Even when they hire 900 extra officers in the Netherlands
- Only way out; Controls smarter with IT innovation

Data Pipeline (Frank Heijmann, David Hesketh)

"**Internet for Logistics**" developed in EU research projects e.g. **CORE**, **CASSANDRA, INTEGRITY,ITAIDE**



Customs IT innovation

- "**Get Data from the Source**"; Customs should use more trade data to cross-validate accuracy of import/export declarations
  - Examples: invoice, purchase order, packing list

- Companies are **willing** and **able** to share their trade data via IT platforms with customs
  - Most companies use enterprise information systems (e.g. ERP)
  - Willing if it provides trade facilitation

- Trade data is available in **IT systems of companies**
  - Can be accessed by customs via IT platforms;
    - Government; e.g. port community systems, single windows
    - Trade: e.g. INTTRA, Descartes, GT-Nexus, SAP, IBM

IT systems enabling Data Pipeline innovation

- **Give border inspections access to company data, by facilitating public-private information exchange**

- **Existing ICT** (NL examples, but similar in many other countries)
  - **Single Window** initiatives by government
    - e.g. Digipoort (NL)
  - **Electronic (!) Phyto Sanitary Declaration systems**
    - E.g. **CLIENT** (NL), **ECS** (KEPHIS, Kenya)
  - **Port Community Systems**
    - e.g. Portbase (Haven Rotterdam), Cargonaut (Schiphol airport)
  - **Logistics & Supply Chain Management software systems**
    - e.g. Descartes, GT-Nexus, INTTRA, IPC, SAP, IBM etc

- **ICT Innovations to further develop Data Pipelines**:
  - **Blockchain** (e.g. Tradelens developed in EU project **CORE**)
  - **Data Analytics** (EU project **PROFILE**)

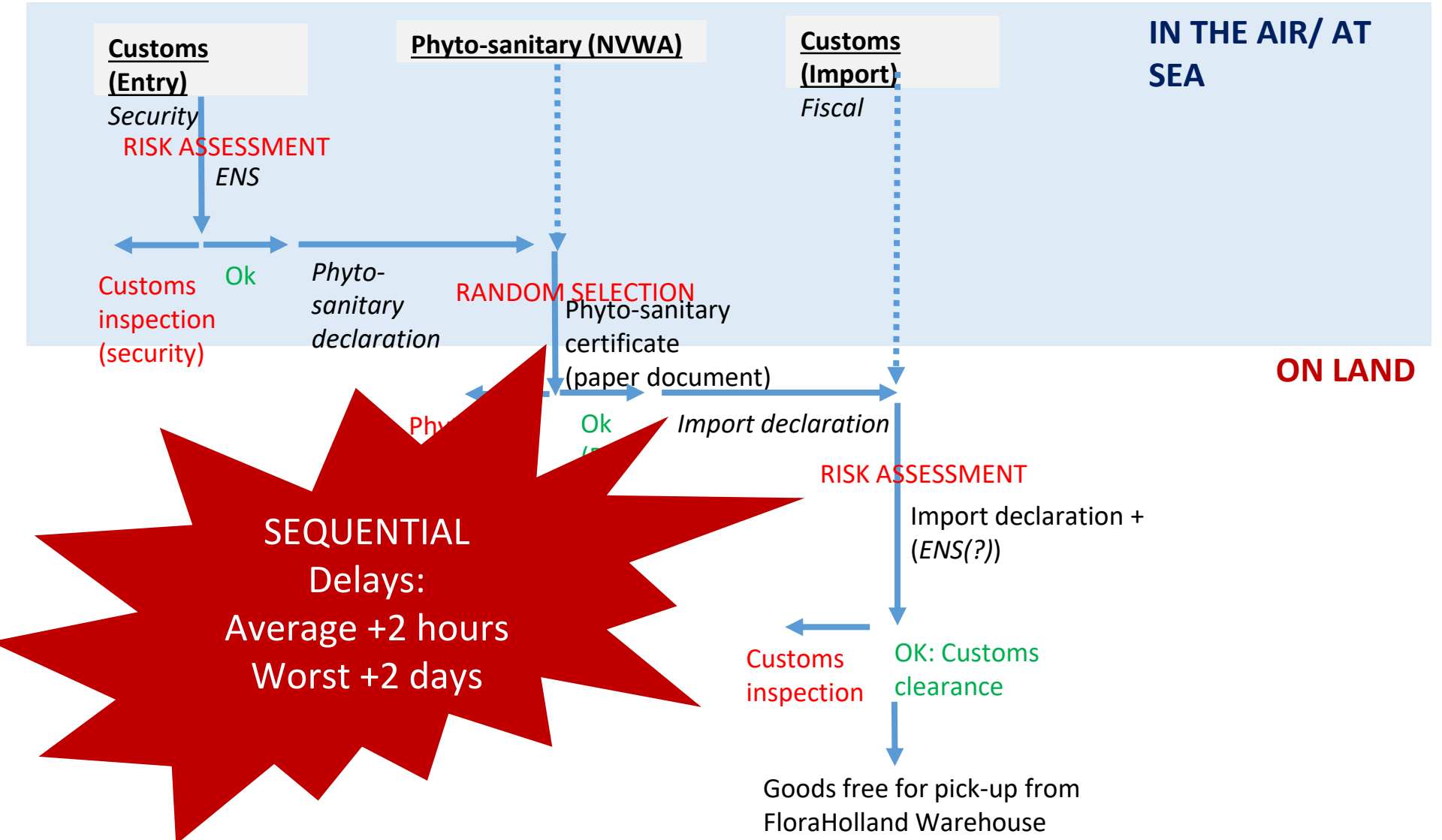
CORE FloraHolland Demo

Coordinated Border Mangement: Integrating Customs and Phytosanitary border control

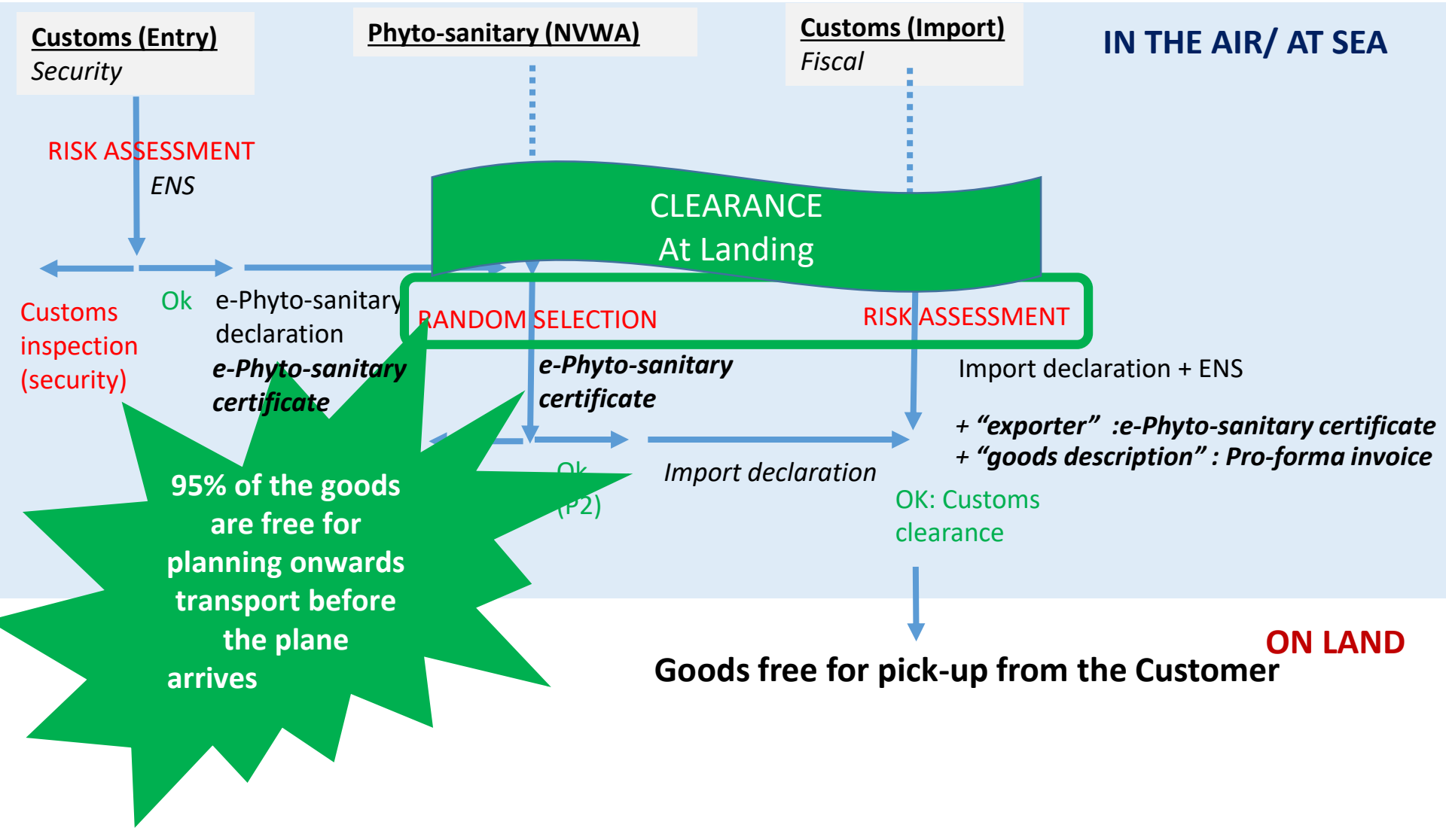
Import of Roses from **Kenia** to **Netherlands**

- Transport organised by FloraHolland from Kenia to Netherlands
  - **90** tons/year, **5** flights/day, pilot with Maersk Reefer Containers
  - Distributed from the Netherlands to all over Europe
- Very active participation in **CORE** of **Dutch Customs**

FloraHolland Air Demo (current)

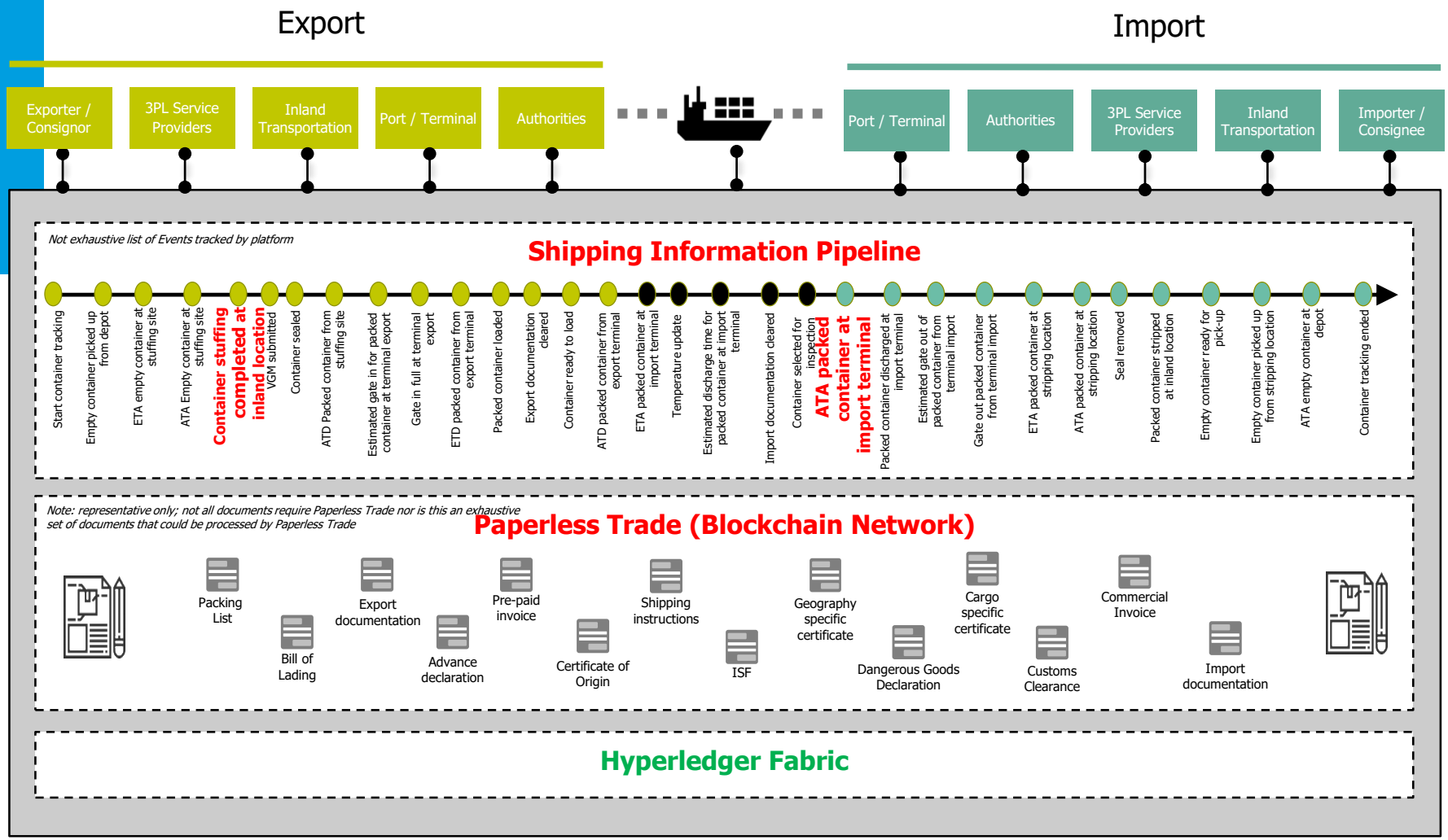


FloraHolland Air Demo (improved)

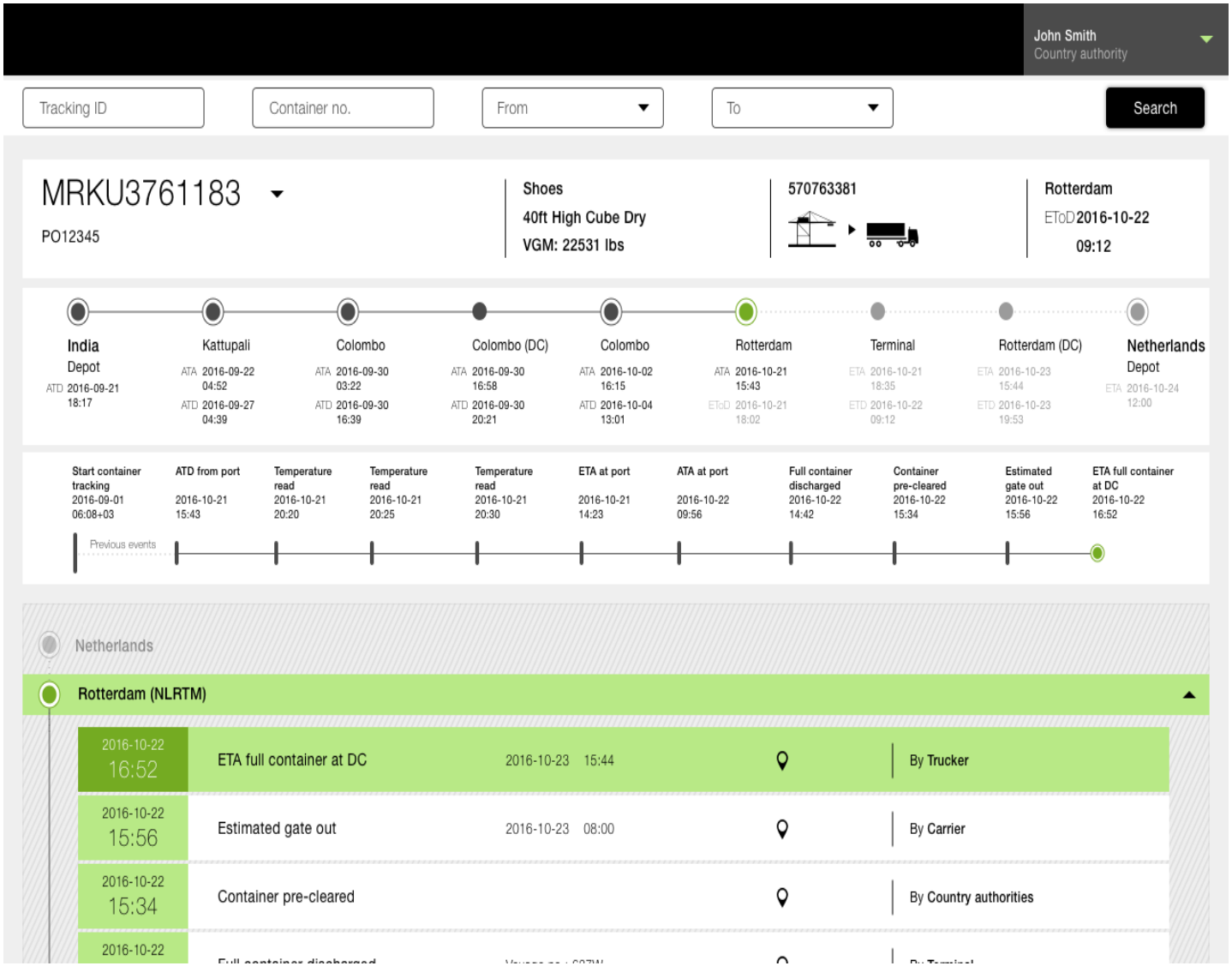


TRADELENS Blockchain IT platform

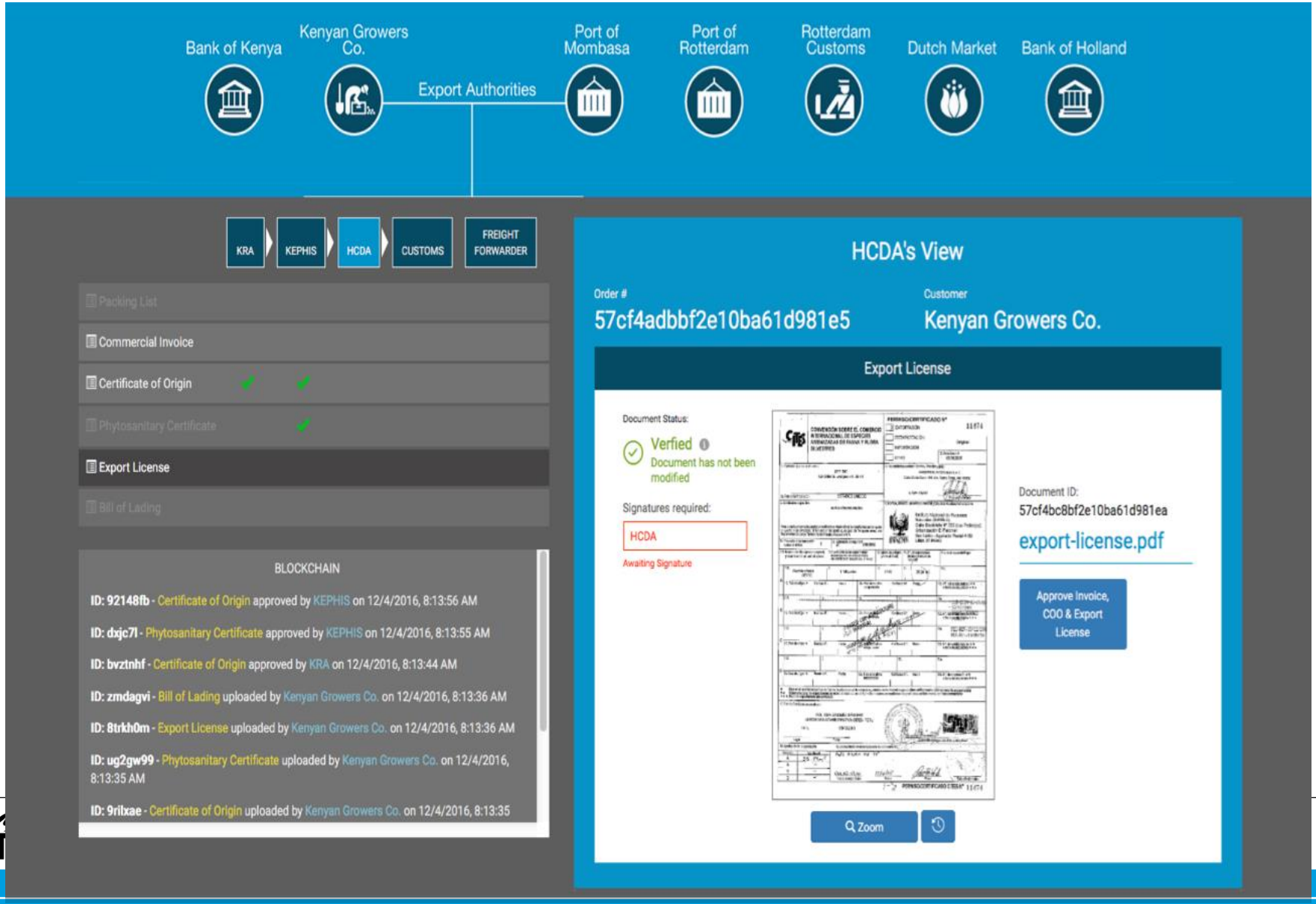
Prototype developed by **MAERSK** and **IBM** in EU project **CORE**



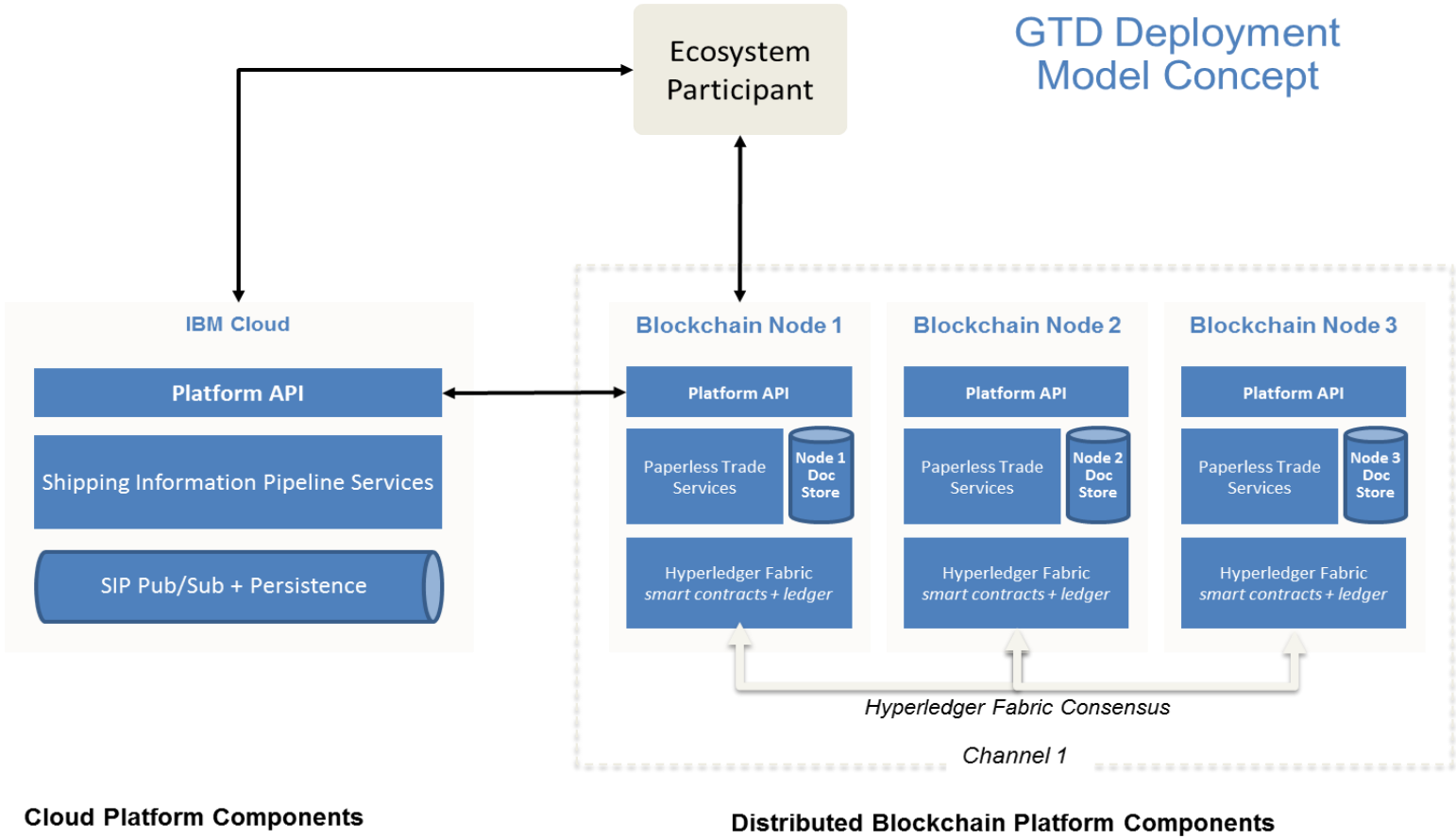
TRADELENS: Shipping Information Pipeline



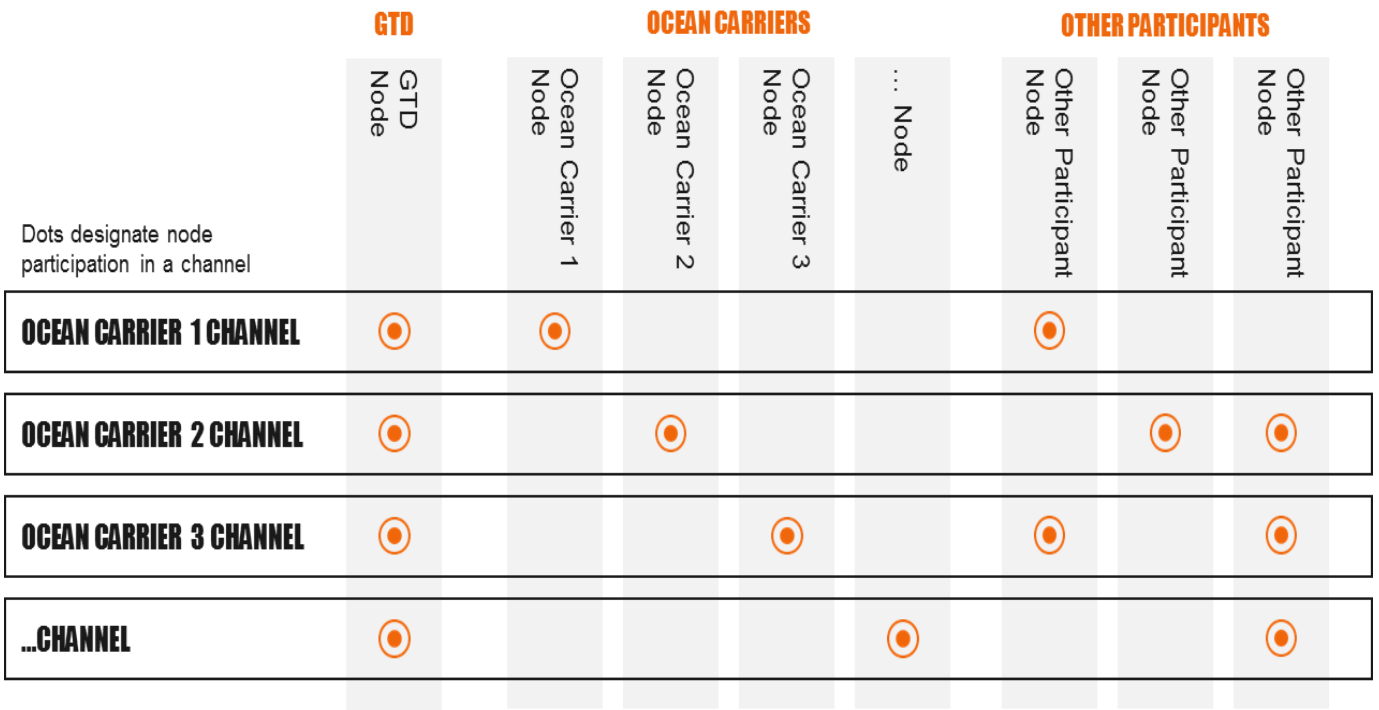
TRADELENS: Paperless Trade (Blockchain)



Tradelens deployment diagram



Tradelens use of channels



Network Status January 2019

Ports and Terminals

Terminal Location	Operator	Status
Algeciras, Spain	Port of Algeciras	◎
Algeciras, Spain	APM Terminals	◉
Apapa, Nigeria	APM Terminals	◉
Auckland, New Zealand	PortConnect	◉
Avonmouth, UK	MCP	◉
Bahrain	APM Terminals	◉
Bilbao, Spain	Port of Bilbao	◎
Brisbane, Australia	Patrick Terminals	◉
Buenos Aires, Argentina	APM Terminals	◉
Busan, South Korea	Port of Busan	◎
Callao, Peru	APM Terminals	◉
Cotonou, Benin	APM Terminals	◉
Elizabeth, NJ, USA	APM Terminals	◉
Felixstowe, UK	MCP	◉
Fremantle, Australia	Patrick Terminals	◉
Gothenburg, Sweden	APM Terminals	◉
Halifax, Canada	Halterm Canada	◉
Hong Kong	Modern Terminals	◉
Houston, TX USA	Port of Houston	◉
Itajai, Brazil	APM Terminals	◉
Izmir, Turkey	APM Terminals	◉
Lazaro, Mexico	APM Terminals	◉

Terminal Location	Operator	Status
Liverpool, UK	MCP	◉
Los Angeles, CA, USA	APM Terminals	◉
Maasvlakte II, Netherlands	APM Terminals	◎
Manila, Philippines	ICTSI	◎
Melbourne, Australia	Patrick Terminals	◉
Montreal, Canada	MGTP	◎
Mobile, AL USA	APM Terminals	◉
Napier, NZ	Napier Port Authority	◎
Newcastle, UK	MCP	◉
Onne, Nigeria	APM Terminals	◉
Philadelphia, PA USA	Packer Terminals	◉
Pipavav, India	APM Terminals	◎
Pecem, Brazil	APM Terminals	◉
Poti, Georgia	APM Terminals	◉
Rotterdam, Netherlands	APM Terminals	◉
Sydney, Australia	Patrick Terminals	◉
Singapore, Singapore	PSA	◉
Tangier, Morocco	APM Terminals	◉
Tauranga, NZ	PortConnect	◉
Teesport, UK	MCP	◉
Valencia, Spain	Port of Valencia	◉
Visakhapatnam, India	JM Baxi	◎

Ocean Carriers

Ocean Carrier / Short Sea	Status
Maersk Line	◉
Safmarine	◉
Sealand	◉
Hamburg-Sud	◎
Pacific International Lines	◎
KMTC	◎
Seaboard	◎
Namsung	◎
Boluda Lines	◎

Government Authorities

Authority	Status
Australia Home Affairs	◎
Bahrain Customs	◎
Canada Customs	◎
Dutch Customs	◎
Ghana / GCNET	◎
Saudi Arabia Customs	◎
Peru Customs	◎
Singapore Customs	◎
Turkey Customs	◎

◉ **Live**: The Network Member is connected to the Platform and providing data

◎ **In Process**: The Network Member engaged and/or integration is in process

Some members engaged under Early Adopter Program and/or trial agreements

Inland Transportation

Transportation Provider	Status
Ancotrans	◉
CN Rail	◎
IMCC	◉

Shipping Events

+ 350M per year

1M per day

TU Delft

Large Volume of Containers and Data

- **TRADELENS global roll-out**
  - Many global companies participate
  - Large number of container (> **1,6 million!)**
  - Large number of container event data and documents (> **350 million**!)
  - Active piloting of Dutch Customs (and various other Customs!)
  - Dutch Customs built *Customs Real-Time Information* (CRIS) system to connect to data pipelines such as Tradelens
    - will be integrated in new version of Dutch customs declarations system AGS

- **TRADELENS currently connected to**
  - Container Carrier systems (e.g. MAERSK, Hamburg Sud)
    - June 2019 MSC and MCA joined
  - Various container terminals (e.g. APMT Rotterdam, Houston, Singapore, Lima)
  - Various Ports/Port Community Systems (e.g. Portbase of Port of Rotterdam, PortNet Singapore)
  - Pilots with many other customs administrations: Australia, Canada, Peru, Saudi Arabia. Turkey etc.

Benefits of Blockchain for Customs

- Blockchain platform is very suitable for sharing logistic events and documents among all parties in supply chains
  - Immutable: data cannot be changed
  - Secure: data cannot be read by competitors without authorization, but always accessible for customs

- Customs can use blockchain platform as **data pipeline** solution to collect extra business documents to detect fraud with customs declarations; examples: Pro-forma invoice, Packing list, Certificates (e.g. origin, phytosanitary, veterinarian)

- Tradelens is now piloted with various customs all over the world
  - E.G. pilot the new **Customs Real-time Information System** (CRIS) of Dutch Customs

- TAXUD is doing pilots with EMCS and eATO
  - See https://youtu.be/qsmo7VOqATI

PROFILE

GOAL Develop modern data analytics and leverage Big Data and open data sources for customs risk management

PARTNERS 15 partners (5 Customs)

BUDGET 5 million EUR

Customs Administrations

- Belgium
- Estonia
- Netherlands
- Norway
- Sweden

Other Partners

- Cross-border Research Association(Coordinator)
- Netherlands Organisation for Applied Scientific Research
- The Swedish Defence Research Agency
- The Norwegian Defence Research Establishment
- IBM
- INLECOM
- BMT
- Joint Research Centre
- TU DELFT
- University of Lausanne

DURATION 36 months **START** 1 August 2018

Benefits of Data Analytics for Customs

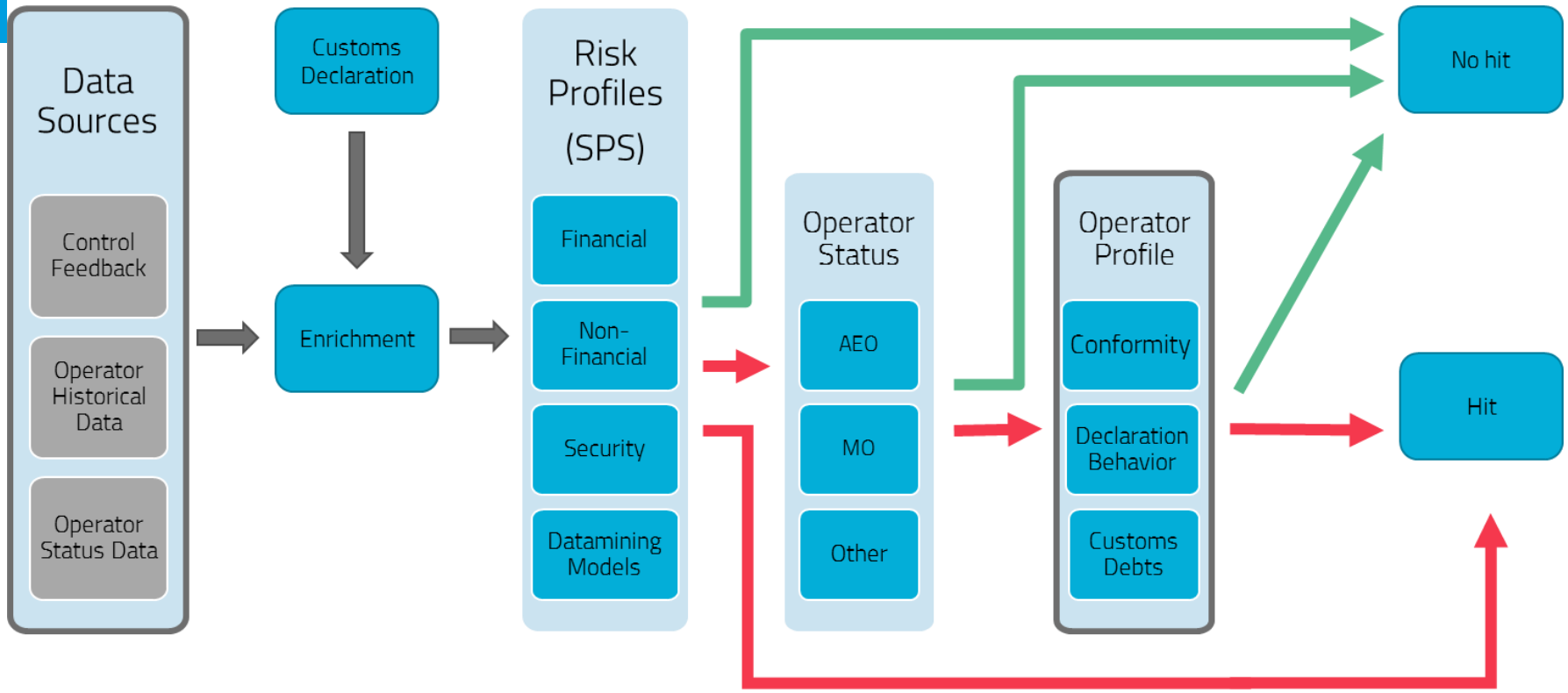
- NL Pilot: Check price on import declaration of e-commerce goods
  - by automated search of price of goods on e-commerce web sites (thousands!)

- **Data Analytics** to do **automated search** of e-commerce web sites
  - Compute average price from these web sites
  - Support tool for customs targeting officer to cross-validate stated value in customs declaration
  - Developed in EU research project PROFILE

- This data analytics will be piloted in the new **Customs Real-time Information System** (CRIS) of Dutch Customs

Belgian Customs Operator Profiling

SEDA 2.0 selection engine



Observations

- Decision points where **DA benefits** are **most useful**
  - Use DA to decrease **False Positive** inspections?
    - Now typically 94% False Positives
    - What if DA would improve that to 70% False Positives?
    - Less ineffective inspections, hence increase customs efficiency
      - Needed to be able to process the huge growth in declarations due to e-commerce and Brexit
  - Use DA to decrease **False Negative** inspections
    - "catch more illicit trade"
  - Different types of DA innovation (e.g. different training data sets)

- Customs **Resource limitations** constrain DA benefits
  - More true positives also requires more customs staff
    - to inspect
    - for administrative after processing (fines, reporting etc.)
  - **Trade-offs** have to be considered between DA innovation and customs resource limitations