Opportunities of blockchain applications for the supply chain

The use of blockchain for phytosanitary certificates

Geneva – World Trade Organization

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1. Port of Antwerp – some facts & figures

2. Potential of blockchain in the maritime supply chain

3. Pilot case: the ePhyto certificate in the Port of Antwerp
1
Port of Antwerp – some facts & figures
Biggest coffee depot
27 billion cups of coffee

Biggest steel port in Europe

Biggest banana import port
8 billion bananas per year

Second biggest chemical cluster worldwide

Biggest tobacco supply worldwide
2

Potential of blockchain in the maritime supply chain
1 maritime transport, on average:

- 30 – 40 participating actors
- ± 200 different interactions on documents
# Maritime supply chain - inefficiencies

<table>
<thead>
<tr>
<th>Inefficiencies</th>
<th>Port and hinterland stakeholders</th>
<th>Authorities</th>
<th>Other third parties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shipper</td>
<td>Freight forwarder</td>
<td>Customs declarant</td>
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<tr>
<td>Time</td>
<td></td>
<td>X X X X</td>
<td>X</td>
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<tr>
<td>ETA/ATA estimation</td>
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<tr>
<td>Operations planning</td>
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<td>X X X X</td>
<td>X</td>
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<tr>
<td>Document flow</td>
<td></td>
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<tr>
<td>Goods ownership documents (CMR, B/L,...)</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Hardcopy documents (Phytosanitary certif.)</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Customs declaration</td>
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<td>X X X X</td>
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<tr>
<td>Information flow</td>
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<tr>
<td>Track and Trace</td>
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<tr>
<td>Payment confirmation</td>
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<td>X X X X</td>
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<tr>
<td>Cargo related</td>
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<td></td>
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<tr>
<td>Shipment fragmentation</td>
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<td>X X</td>
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<tr>
<td>Loading units</td>
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<tr>
<td>Financial flow</td>
<td></td>
<td>X X X X</td>
<td>X</td>
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</table>
Early adopters in the maritime supply chain

Maritime Logistics + Blockchain Timeline
Select 2017 Blockchain Partnerships and Initiatives in the Maritime Logistics Space

Port of Antwerp

www.cbinsights.com
Pilot case: the ePhyto certificate in the Port of Antwerp
ePhyto exchange via Blockchain

• Proof of Concept was set up for a specific apple trade between New Zealand (Port of Napier) and the Port of Antwerp

• PoC builds further upon Smart Contract building blocks, on top of the basic blockchain technology

• Executed during the months June, July & August 2018 (launched on June 14th)
• Pilot objectives:
  • creating a more secure and efficient maritime trade process by developing a digitized phytosanitary certificate based on blockchain technology
  • to make use of blockchain technology as a sustainable solution for reliability and traceability in b2g-interactions
  • to illustrate a working concept for certificates management in a digital, electronic way
  • to prove process improvements compared with the actual paper-based process

• Benefits to prove :
  • faster: no shifting and waiting on papers, paper losses, ...
  • earlier: NPPO sees the certificates much earlier in the process, as they are uploaded
  • more environmental friendly solution: less papers, no paper-transports, ...
  • secure & reliable: no fraude possible via use of BC technology
  • traceability via BC audit-trail
Pilot case: phytosanitary certificate

A declaration used in international commerce for shipments of plants and plant products. Certificate issued by the National Plant Protection Organisation of the exporting country to be presented to the NPPO of the importing country.

Source: “Digitizing the phytosanitary certificate” by C. Peeters (2018)
Why this project?

- Solutions available on g2g-level
  - Bilateral agreements between countries
  - European TRACES system for EU member states
  - IPPC ePhyto Hub pilot

- But no (digital) visibility nor interactions on b2b- and b2g-levels
  - exporter – importer
  - importer – forwarder
  - forwarder – NPPO

- A very strong belief in use of blockchain for documents & certificates in a b2g-context

- …although we know that, from a legislation viewpoint, this solution will not be accepted ‘today’ in an official context
Pilot case – process flow
Pilot case – blockchain infrastructure (1)
ePhyto app

- Web UI access for every stakeholder in the supply chain (exporter, importer, forwarder & NPPO)
- APIs available, so ERP-integration is possible
ePhyto app (2)
Costs versus Benefits

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<tr>
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<th>Costs</th>
<th>Benefits</th>
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</thead>
<tbody>
<tr>
<td><strong>FAVV (Belgian NPPO)</strong></td>
<td></td>
<td>- administration reduction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- optimisation control process</td>
</tr>
<tr>
<td><strong>Port of Antwerp</strong></td>
<td>pilot case facilitation</td>
<td>- competitiveness (port + MarSC)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- keep / attract cargo flows</td>
</tr>
<tr>
<td><strong>Exporter</strong></td>
<td>Subscription fee or ERP-integration</td>
<td>digital upload reduces high delivery costs</td>
</tr>
<tr>
<td><strong>Importer</strong></td>
<td>Subscription fee or ERP-integration</td>
<td>- no time loss</td>
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<td></td>
<td></td>
<td>- administrative simplification</td>
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<tr>
<td></td>
<td></td>
<td>- electronic archive</td>
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<tr>
<td><strong>Terminal operator</strong></td>
<td>Subscription fee or ERP-integration</td>
<td>- staff time reduction</td>
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<tr>
<td></td>
<td></td>
<td>- eliminate risks of too early pickup</td>
</tr>
<tr>
<td><strong>Forwarder</strong></td>
<td>Subscription fee or ERP-integration</td>
<td>- No time loss</td>
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<td>- electronic archive</td>
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<tr>
<td></td>
<td></td>
<td>- Less risks in orchestrating their supply chain</td>
</tr>
</tbody>
</table>
Next steps – working in parallel

**Operational perspective:**

- Extending the current pilot case with other countries & communities
- Extending with other stakeholders, e.g. Customs
- Extending not only in maritime port context, but also in airport context (e.g. Brussels Airport Company)
- Piloting with other certificates/documents:
  - Veterinary certificate
  - Certificate of Origin
- Aligning with other, similar initiatives on a global scale (integrating platforms)

**Regulatory perspective:**

- Following, supporting, … legislation changes on digital ‘context’:
  - uniformity between paperbased and fully digital processes
  - uniformity between paper and digital documents
  - legal equality between handwritten and electronic signatures (e.g. awaiting Implementing Act on electronic signatures for phytosanitary certificates)
Conclusions

- Great potential
- Open for any type of document, certificate, authorisation, ...

- Tresholds:
  - Legislation
  - Global aspect (i.e. complexity)
  - Commercial risk
  - Time to market

- Challenge – from Pilot to Practice

- “Chain thinking”
  Don’t do this by yourself, but work and think together

Co.CREATE → Co.INNOVATE
Thank you!