AEOLIX - Architecture for EurOpean Logistics Information eXchange for logistics services

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Content

• Background & needs
• AEOLIX project
• European Logistics Information exchange Innovation Platform
• Conclusions
Standardisation

• Many digital platforms on freight transport and logistics:
  – EC FP & H2020 Projects solutions
  – Port Community systems & Cargo Community System (CCS)
  – e-Customs platforms
  – Single Window platforms
  – Proprietary ICT /ITS Solutions

• Open standards and EU initiatives
  – UBL/XML, EDIFACT, GS1, Open Data Standards, DATEX II
  – ITS Directive, RIS, eMaritime
  – (ETPs), such as ALICE, ERTRAC, ERRAC, Waterborne
Digitalisation in Logistics

Enhanced supply chain visibility

More efficiency and better resilience

Fewer costs, less administrative burden

New business opportunities

Optimised choice of transport services

Better transport and event management

Increased load factors

Fewer CO2 emissions
**Business Needs**

<table>
<thead>
<tr>
<th>Needs at Hubs Ports, Terminal</th>
<th>Management Needs</th>
<th>Data needs</th>
<th>Interface level needed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Process control, customs clearance</td>
<td>Vessel Load</td>
<td>Data availability, visibility</td>
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<tr>
<td></td>
<td>Capacity planning, scheduling</td>
<td>Berthing schedule, Load plan, ETA, container location, customs clearance status</td>
<td>Document transfer</td>
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</table>

<table>
<thead>
<tr>
<th>Visibility Needs at Supply chain</th>
<th>Management Needs</th>
<th>Data needs</th>
<th>Interface level needed</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>End to end visibility and exception management</td>
<td>Load size, and format, origin, destination, asset availability, capacity availability, schedule, voyage reports, travel authorisation, shipment location, shipment status</td>
<td>Data availability, visibility</td>
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<td>Vertical cooperation and mode conversion</td>
<td>Data availability, visibility</td>
<td>Document transfer</td>
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<td>Online booking links, confirmation</td>
<td>Intelligent agent, exception alerts</td>
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<thead>
<tr>
<th>Network Optimisation needs</th>
<th>Management Needs</th>
<th>Data needs</th>
<th>Interface level needed</th>
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<tbody>
<tr>
<td></td>
<td>Load factor, capacity optimisation</td>
<td>Combined demand</td>
<td>Lane analysis</td>
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<tr>
<td></td>
<td>Horizontal collaborations</td>
<td>Combined loads, combined locations, combined destinations</td>
<td>Optimisation algorithms</td>
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<td></td>
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<td>Corridors</td>
<td>Cost analysis</td>
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<td></td>
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<td>Combined lanes, schedules</td>
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</table>
But new challenges appear...

<table>
<thead>
<tr>
<th>Lack of interconnected systems</th>
<th>Process digitalisation and re-engineering</th>
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<tbody>
<tr>
<td>Data challenges:</td>
<td></td>
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<tr>
<td>i. Data ownership, sharing, access to data, re-use of data</td>
<td>Non-interoperable standards</td>
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<tr>
<td>ii. Lack of trust/data confidentiality</td>
<td></td>
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<td>iii. Data protection, cybersecurity</td>
<td></td>
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<td>iv. Big data, added value creation</td>
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<tr>
<td>Non-recognition of e-Transport documents</td>
<td>New business models</td>
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<tr>
<td>Governance</td>
<td>Low cost solutions, accessibility for SMEs</td>
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</table>

The AEOLIX Platform represents a critical way forward of supply chain interoperability through decentralised information sharing. AEOLIX is established via cloud services where data, application, on-premises and cloud-based processes and services from multiple actors can be connected - enhancing collaboration and interoperability, potentially across the entire freight transportation system.
AEOLIX Objectives

- Thorough insight into lessons learned, needs and requirements
- Architecture for a collaborative IT infrastructure for operational connection of logistics information systems
- Appropriate data access management model
- Common but user-tailored interface and tools to enable the IT infrastructure
- Testing, validation and implementation of the AEOLIX concept
- Results about the real impacts of AEOLIX
- Creation of awareness of AEOLIX, and prepare its Europe-wide deployment
AEOLIX IT Architecture

Interoperability | Reuse of Assets | Decentralization | Scalability
--- | --- | --- | ---
Real-Time / Responsiveness | Service Toolkit | Simplicity | Security
AEOLIX Living Labs

Multi/syncromodal Transport
- Thessaloniki-Balkans & central Europe via rail/road
- Gothenburg-Hamburg, Bratislava load control centre, Trieste to three TEN-T corridors (Scandinavian-Mediterranean, Mediterranean, Baltic-Adriatic)
- Urban Port Bordeaux & Atlantic Corridor
- UK - Continental EU - China logistics
- Bucharest-Vienna: Inland waterway

Intelligent Hubs
- Sea ports: Hamburg, Gothenburg, Bordeaux, Trieste
- Railway hubs: Hamburg, Trieste Northamptonshire
- Inland waterway (barge) terminals: Bucharest Vienna
- Ports Cities: Bordeaux, Gothenburg
- Virtual freight centres: Thessaloniki Industrial Area

Network Optimisation
- The whole logistics network, incl. ports, inland transport (road, train, barge) in The Netherlands, Germany and Spain
- All sites that will cover multi/ synchromodal transport
Example – e-navigation: AEOLIX

Port e-navigation Scenario 1: reduce business and waiting time for the freight transport due to delays of ocean/vessel carrier

Ocean Vessel Carrier System

Toolkit Services - ETA Service

Governance
Port collaboration Scenario 1 - data exchange rules

Interoperability
Data transformation, Port type repository,

Connectivity

Vessel Schedule
Vessel ETA
Container Availability Schedule
Container Availability Schedule Update

Port Train Dashboard
Port FF Dashboard

Legend:
CS = Ocean Vessel Carrier System
VS = Vessel Schedule
CU = Container Update
ETA = Estimated Time of Arrival
Conclusions

**Challenges:** technical, security, new use cases, new business models

**Innovate:**

<table>
<thead>
<tr>
<th>Interoperability</th>
<th>Technical</th>
<th>Legal</th>
<th>Business</th>
<th>Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interfaces with any logistics information systems</td>
<td>Distributed open system through configurable plugin APIs.</td>
<td>Data access, privacy, identification, authentication</td>
<td>Enable low-complexity and low-cost connectivity</td>
<td>Open to all stakeholders across modes, within and across related supply chains.</td>
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<tr>
<td>Support continued development of standardized formats</td>
<td>Demand driven from users rather than supply driven</td>
<td>Secure, Resilient and Trusted environment procedures</td>
<td>Business models and public-private governance</td>
<td>Towards an EU Single European Transport Area</td>
</tr>
</tbody>
</table>
AEOLIX on the “Europe in My Region” map for H2020 projects

http://aeolix.eu
http://aeolix.eu/new-update-and-design-of-aeolix-vision-is-now-available
Thank you for your attention!
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