Frameworks & Applications for Logistics

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Co-funded through EU FP6 DG TREN

**EU Ambition**

- **Letting**

  compete with

  involving SMEs as users and service providers
Beyond Intermodal Transport
"EDIFACT" Challenge

x K Euro

COPRAR

y K Euro

COPRAR

z K Euro

COPRAR

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OpenTravel Architecture

User interfaces / Sales points

Booking engines

GDS (1 or more)

Freightwise: Decentralised reservation system
Implications

- Letting compete with involving SMEs as users and service providers

Freightwise “Architecture”

- User interfaces / Sales points
- Booking engines
- GDS (1 or more)
- Freightwise: Decentralised reservation system

Need for standard definition of Transport service
## Terminology Confusion

<table>
<thead>
<tr>
<th>English Superior roles</th>
<th>Detailed roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traveller</td>
<td>Scheduled Transport Passenger</td>
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<tr>
<td></td>
<td>On-demand Transport Passenger</td>
</tr>
<tr>
<td></td>
<td>Crew</td>
</tr>
<tr>
<td></td>
<td>Crew in Transit</td>
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<tr>
<td></td>
<td>Transport Network User</td>
</tr>
<tr>
<td>Public Purchaser</td>
<td>Public Purchaser</td>
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<tr>
<td>Transport User</td>
<td>Consignee</td>
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<tr>
<td></td>
<td>Consignor</td>
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<tr>
<td></td>
<td>Traveiler</td>
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<tr>
<td></td>
<td>Cargo owner</td>
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<tr>
<td></td>
<td>Transport Consumer</td>
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<tr>
<td>Transport User Agent</td>
<td>Transport Organiser</td>
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<tr>
<td></td>
<td>Importer</td>
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<tr>
<td></td>
<td>Exporter</td>
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<tr>
<td></td>
<td>Chamber of commerce</td>
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<tr>
<td></td>
<td>Shipping operator</td>
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<tr>
<td></td>
<td>Freight Forwarder</td>
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<td></td>
<td>3 PL</td>
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<td>4 PL</td>
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<tr>
<td></td>
<td>Lead Logistics Provider</td>
</tr>
<tr>
<td></td>
<td>Trucking company</td>
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<td></td>
<td>Shipping operator</td>
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<tr>
<td></td>
<td>Shipowner</td>
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<tr>
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<td>Rail operator</td>
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</tbody>
</table>
• A multimodal framework for transport
• A generic framework - independent of transport mode, technology, and organisation
• Interoperability
Framework Requirements

- Support multimodality (co-modality)
- Be stable and easy to refine and expand
- Be independent of current solutions
- Provide a total picture (include freight and passenger transport)
- Facilitate hiding of complexity (abstraction, simplification)
- Focus on interoperability (not on inner parts of systems)
- Independent of technology
Reference Model

Transportation Network Management

- Transportation Network Infrastructure Management
- Transportation Network Utilisation
- Regulation Enforcement
- Emergency Management

Transport Demand

Transport Supply

- Transport Service Management
- Transport Operations Management
- On-board Support and Control

Transport Sector Support
Roles

Transport Demand Roles
- Transport User
- Public Purchaser
  - Cargo owner
  - Consignee
  - Consignor
  - Supply Chain Party
  - Transport Organiser

Transport Business Manager
- Transport Operation Manager
- Transport Service Manager
  - Customer Relation Manager
  - Transport Service Planner
  - Case Handler
  - Counter Staff
  - Document handler
  - Emergency Team Personnel
  - Load Item Handler
  - Passenger Manager
  - Safety Surveyor
  - Security Surveyor
  - Transport Product Validator

Transport Service Management Roles
- Transport Service Provider
- Transport Operation Worker
Efficient Cooperation Between Roles

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Transport User

Transportation Network Manager

Transport Network Utilisation and Infrastructure
Provides information about the current and foreseen situation of the network. Controls traffic in the transport network

Transport Service Provider

Transport Supply
Publishes services (Routes, cargo types, etc)
Proposes transport execution plan.
Executes transport
Reports transport status

Transport Support and Regulation
Develops the regulatory framework. Ensures that transport is conducted accordingly

Transport Regulator

Transport demand
Specifies the need for transport and approves transport execution plan based on information of services (routes, terms and conditions).
Monitors status decides corrective actions.

Transport User
Changing Roles

Step 1:
- Transport User 1

Step 2:
- TSP A
  - Transport User 2
  - Transport User 3
  - Transport User 4

Forwarder A

Step 3:
- TSP 1\(^{st}\) leg
  - TSP Terminal 1
  - TSP B
  - TSP 2\(^{nd}\) leg
  - TSP Terminal 2

Roles:
- Transport User
- Transport Service Provider

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Transport service providers publish their service offering
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Delivery confirmation at the customer’s premises
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Marketing

Transport Means

Service Location
- Timing

Type
- Area Description
- Location

Transport Service Description
- ID
- Service Category
- Valid From
- Valid To
- Company Service Details

- Service Charge
- Service Goods Type
- Service Load Unit Type
- Environmental Performance

Point(s)
- Area
Planning

- **Strategic**
  - decide where to produce or where to keep warehouse

- **Tactical**
  - Choose your partners

- **Operational**
  - Plan *what* goods to move *when* between given *origins* and *destinations* i.e.:

**Planning shipments**
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- **Transport User**
- **Transportation Network Manager**
- **Transport Service Provider**
- **Transport Regulator**
The diagram illustrates the processes involved in freight transportation, co-funded through EU FP6 DG TREN. It outlines the steps from planning to execution and completion, involving different actors such as Transport User, Transport Service Provider, Transport Regulator, and Transportation Network Manager. Key processes include:

**Planning**
- Transport service demand definition
- Booking management
- Transport service marketing
- Order management

**Execution**
- Transport task control
- Transport operation management
- Taxes and customs management
- Hazardous goods management

**Completion**
- Transport task termination
- Statistics and management / Information administration
- Statistics

The diagram also highlights the role of the Transportation Network Manager in facilitating transport network utilisation and completion planning.
RFID

- Radio-frequency identification
- Applied to or incorporated into a product, animal, or person for the purpose of identification and tracking using radio waves.
- Some tags can be read from several meters away and beyond the line of sight of the reader.

RFID Tag

- Two parts.
  - Antenna for receiving and transmitting the signal
  - Integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (RF) signal, and other specialized functions.
RFID Types

- **Active tags,**
  - Contain a battery and can transmit signals autonomously

- **Passive tags,**
  - No battery and require an external source to provoke signal transmission and

- **Battery assisted passive (BAP)**
  - Require an external source to wake up but have significant higher forward link capability providing great read range.
Transport Item
Plan

Transport User

Interaction (and planning) ends when Transport Execution Plan is complete

Traffic Manager

Transport Regulator

Transport Service Provider

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Transport Execution Plan - TEP
Local Transport

- Scheduled service
- Two stops
Business Case
Itinerary

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Customer (Transport User)

Factory Dresden

Port of Dresden

Factory Dresden

Port Hamburg

Jeddah

GII

Provider

Truck operator Maxikraft

Provider

Truck operator Richter

Provider

Port of Dresden

Provider

Barge operator DBR

Provider

Terminal Wallmann

Provider

Shipping line Rickmers

Transport provider

Land transport forwarder Heinrich

Transport user

Transport provider

IWT integrator SBO

Transport user

Transport provider

Oversea fwd SDV

Transport user

Transport provider

Factory Dresden

Port Hamburg

Jeddah

TEP 1

TEP 2

TEP 3

TEP 4
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Execute

Transport User

Transport Execution Status

Transport Regulator

Transport Service Provider

Transportation Network Manager

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Transport Execution Status - TES

Transport Execution Status

- Operation Status
- Status Time
- TEP ID
- Time Stamp

Transport Item Status

- Status Type
- Item Time Deviation
- Item Condition Deviation
- Item ID
- Time Stamp

Transport Item Timing

- New ETA

Transport Item Condition

- Condition Type
- Measurement Unit
- Value

Location
Plan

- Transport User
- Traffic Manager
- Network and Traffic Status
- Transport Service Provider
- Transport Regulator
Transportation Network Status

- Weather Condition
- Traffic Information
- Statistics
- Transportation Network Status
  Observation on route?
  Reported time
  Validity
- Incident
  Activities
  Obstruction
  Accident
  Cause
- Network Section
- Source
- Condition

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Transport Operation Status

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Transport User

Traffic Manager

TOS

Transport Regulator

Transport Operation Status

Transport Service Provider
Transport Operation Status

Transport Means ID
Status available?
Time stamp

Source

Stop Point

Status Information
Actual arrival
Actual departure
Estimated arrival
Estimated departure
Special remarks
Time stamp

Location
Processes

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Transportation Network Manager
Transport User
Transport Service Provider
Transport Regulator

Planning
- Transport service demand definition
- Booking management

Execution
- Transport task control
- Order management

Completion
- Transport task termination
- Statistics and management / Information administration

Transport network utilisation
- TNS
- TOS
- TEP
- TSD
- TEP
- TEP
- TEP

Hazardous goods management
- TNS
- TEP
- TEP
- TEP

Taxes and customs management
- TEP
- TEP

Statistics
- STA
Establish Transport Chain

Transport User

- Transport Service Demand definition
  - TEP
  - Search for "relevant" Transport Services
    - TEP
    - TSD

- If no sequence matching the TEP was found
  - TEP
  - TSD

- Find "best" sequence of Transport Services
  - TSD₁
  - TSD₂
  - TSD₃

- Negotiate conditions (for each TS)
  - TEP₁
  - TEP₂
  - TEP₃

- Book Transport Service (for each TS)

Transport Service Provider

- Offer Transport Services
- Negotiate conditions
- Order management

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Deployment

- UN/CEFACT and UBL – Specifications and implementation guidelines
  - Leads to different interpretations

- Freightwise: Issuing standard "free of charge" software components
Providing connectors to:
- Inttra
- Oracle
- SAP
- …
INTTRA – Representing UN EDIFACT Investments

- The Largest Multi-Carrier E-Commerce Platform for Global Shipping (Containers)
Current Steps

- Implementation under way as a cooperation essentially between ANCO and Logit Systems, supported by MARINTEK

- Implementation based on UML core components

- Validation in business cases
Verification Through 9 Business Cases

- A1 – ship and truck
- A2 – rail, ship, and truck
- B – rail, but focus on information related to "traffic management"
- D – all modes, linking several information service portals
- E – road, ship, with focus on planning road transport to avoid congestion
- F – inland waterway and intercontinental shipping
- G – rail and road
- H – rail, road, and ship
- J – rail and road
Thanks