Recommendations from SMART-RAIL to attract potential customers using rail Ming Chen, TNO



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Smart-Rail

'Smart Supply Chain Oriented Rail Freight Services':

- Smart ICT supported
- Supply Chain Oriented Shipper's logistical needs
- Freight currently by **road** (i.e. Shift to Rail)
- Rail Services flexible, reliable, visible, short lead time (commodities perspective), low (logistical) costs

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Smart-Rail objectives



- Contribute to a mental shift of the rail sector toward a supply chain focus
- Develop working business models for supply chain cooperation for the rail sector.
- Develop a methodology and architecture for exchange of data/information.
- Establish three Continuous Improvement Tracks (CITs; also called Living Labs):
 - CIT 1 Dedicated services with wagonload trains.
 - CIT 2 Managing connectivity of rail with other modes by a logistical control tower.
 - CIT 3 Reliability of rail and (unexpected) obstructions on the track



Mental shift to supply chain focus: Traditional Rail sector perception

- Primary focus on needs of (current) clients
- The start and end of the process is at the rail terminals > no supply chain/cargo focus
- System focus on train movements between terminals > same priority empty and loaded trains & no difference bulk and containers.
- The contracted service delivered is to bring the cargo from A to B > time (waiting) used as solution for issues



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User perspective: multi-modal options

- Consider all modes and (multi-modal) routes available between origin and destination of cargo
- Use the option with minimal logistical costs, incl.:
 - Costs supply chain organisation
 - Direct costs transportation modes
 - Costs transhipment/handling
 - Lead time for each link
 - Lead time for each node (incl. dwell time)
 - Scheduling Risks (unreliability/unpredictability)

SMART & RAIL



Position of rail in the supply chain





Costs for dealing with unpunctuality

- Warehousing (buffers) => Inflexibility supply chain design
- Costs due to inefficient use of capacity at hubs
 => terminal costs

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- Productivity loss of assets and labour in following supply chain processes
- Market loss

Indication of Supply Chain costs

- Direct Rail costs: 0,02 0,03 euro/tonkm
- Time related Supply Chain Costs depending on commodity type: 0 – 2 euro/hour (also for road)
- Other Supply Chain costs additional to road: 0,02 euro/tonkm

=> direct rail costs +/- 50% of rail related SCC

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Reduce supply chain costs for rail users by improving:



- **Reliability:** Reduction of delays and
- Lead time: Reduction of waiting times along the routes
- Costs: Decrease the logistical/supply chain costs (not only direct rail costs)
- Flexibility: Establish protocols for organising alternatives
- Visibility: Real-time operational information
- Improved coordination between rail and non-rail stakeholders



Solution pathways

General transition options:

- 1. Incremental system adaptation
- 2. Disruptive system change





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(1) Rail sector characteristics

- Rail system is designed for stability (safety), individual deviations introduce risks....
- Machine type of organisation (Mintzberg):
 - Focussed on control of performance
 - Fragmentation of responsibilities within and between organisations
 - Traditions are highly valued

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(1) Barriers in practice

- Complex system, many interdependencies
- Small space to manoeuvre
 - Each (major or small) action requires more than one stakeholder:
 - cooperation
 - new business models
 - ICT/data exchange
- Investing time and money
- Trust, openness, adjustment organisation
- Competitive advantage by innovation largely at sector level due to the cooperative approach

Smart-Rail focus on organisational improvements (cost efficient solutions)



(1) Short term solutions

- Increase Supply Chain/user orientation
- Focus on visibility (ATD & ETA) information
- Completion and enrichment TIS and ensure trusted data environment (incl. blockchain & Smart-Contracting)
- Facilitate processes by innovative business models and start-up simplification
- Door-to-door focus of (wagonload) services



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Demonstrated volume growth of 30%-60%/year in LLs

(2) Disruption as solution?

'Automation of the core activities of a machine type organisation will turn it into a more organic organisation.' (Mintzberg)

This automation should be focussed on the part that is causing the barriers so:

- enlarge the space to manoeuvre in a more flexible rail management system
- Reduce the need for cooperation by operational automation and integration



(2) Acceleration of innovation



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Key recommendations

- Continued stimulation of changing (the mind-set) towards user/supply chain orientation
- Support cooperation by :
 - Assignment of neutral coordinators for cooperation
 - Ensure availability of required information (beyond current RNE TIS) and access to relevant information for third parties (rail and non-rail)
 - Dedicated business models creating joint interests & responsibility
 - Support for initiation and establishing the cooperations (also for setting up new services by SMEs)
- Reducing the mutual dependency by a radical system change (long-term).

