Is it Possible to Manage and Plan Co-Modal Freight Transport Without a Centralised System?

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ABSTRACT

The European Union has looked to develop ICT systems that are open and interoperable. Through the case study of the Freightwise research project a research gap was identified: Is it possible to manage and plan co-modal freight transport without a centralised system? The adoption of software methodology and business process mapping enables the development and the validation of the Freightwise Framework for co-modal freight transport. The Framework divides the freight transport domain into manageable sub-domains and defines the main roles that need to interact as well as the necessary interactions in between these domains. The main roles identified are: the Transport User and the Transport Service Provider, supported by the Transportation Network Manager and the Transport Regulator. The Framework also defines a generic specification of a transport service and a small set of sufficient and necessary information objects that need to be exchanged between the four main roles. This paper explores the goal, context, methodologies utilised, results and validation in multiple business cases. The paper ends with reflections on how the results may be developed and implemented.

Keywords: Co-Modal, E-Freight, Framework Architecture, ICT, Intermodal, Logistics

INTRODUCTION

The European Union identified a research gap, whether intermodal and co-modal operations could be made more efficient by the seamless transfer of paperless data. The paper show, using the case study of the Freightwise project, a viable solution for multi modal ICT based communication between all actors that is modally and systematically agnostic, allowing integration between different transport operators and different ICT implementations. Built on the ARKTRANS (Marit, 2004) initiative, the project established a Freightwise Framework (FWF) for efficient co-modal freight transport. The aim is to optimise the activities’ efficiency,
by simplifying the interaction between stakeholders and by defining the minimum set of main roles that need to interact between the stakeholders. A reference model is developed and divided the freight transport domain into sub-domains defining the necessary interactions between them. The main reference roles are: Transport User and Transport Service Provider, supported by the Transportation Network Manager and the Transport Regulator. In addition a generic specification of a transport service (a Transport Service Description) and a small set of information objects that need to be exchanged between the four main roles were defined. Three information objects are defined between the Transport User and the Transport Service Provider: Transport Service, Transport Execution Plan and Transport Service Status. This paper explores the goal, context, methodologies utilised, results and validation in multiple business cases. The paper ends with reflections on how the Framework meets business needs and how it may be revised accordingly.

**CONTEXT**

An efficient transport system is at the heart of economic growth in a global market. It is also a source of negative effects including congestion, noise, and air pollution (Maibach, 2007). The European Commission (EC) aims at achieving a sustainable and competitive transport systems (European Commission, 2011). Roads in Europe are highly congested and in many areas unable to take any more traffic. Over the last ten years road freight market share has been increasing while the rail freight share has decreased, even though the modal shift of freight from road to rail, sea and canal and the use of inter-modality has been at the heart of European transport policy (Holvad, 2009). The EC in 2006 introduced the policy of co-modality (European Commission, 2006). This freight transport policy includes the operational technique of inter-modality, and aims to optimise each mode’s strength *separately and together*, in the pursuit of sustainable economic growth and jobs. In this context the EC has looked to develop ICT systems that are open and interoperable and support the Commission’s policy. The Freight Transport Logistics Action Plan (European Commission, 2007) explicitly calls for the development of e-freight and states:

“*(ICT) can greatly contribute towards co-modality by improving infrastructure, traffic and fleet management, facilitating a better tracking and tracing of goods across the transport networks and better connecting businesses and administrations. However, a number of obstacles to a more wide-spread and seamless use of ICT in freight logistics need to be overcome, including the insufficient standardisation of the respective information exchanges and market actors’ disparate capabilities to use ICT...*”

The Internet is now widely used for the booking of air tickets and hotels using systems where airlines and hotel operators have published their services in central databases. However the research identified that it is not the centrality of the database that enabled these systems but the standardisation of the format in which the services were defined. For air transport standard names for airports are used to enable connection of flights when there is no direct flight. In principle, there is no reason why similar capabilities should not be offered for freight transport (Gudmundsson, 1998). Certain portals are offering services, but many of them are offered by large transport operators to be used for their own transport operations. In addition the freight transport market is characterised by large numbers of small freight operators and research has shown that a centralised platform is not required for ICT integration (Zunder, 2011).

The research asked the question: Is it possible to manage and plan co-modal freight transport without a centralised system? The hypothesis that was developed was that this is possible if “all” transport service providers publish their services on the Internet in a standardised format and that the essential interactions between transport users and transport
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