PROJECT

CroBIT

Cross-Border Information Technology

**Funding:** European (5th RTD Framework Programme)

**Duration:** Feb 2003 - Jan 2005

**Status:** Complete with results

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**Background & policy context:**

Service reliability is now surpassing pricing as the most important customer criteria for choosing a particular mode of transport. To meet this requirement and to attain a higher market share, Cargo railways have to develop a strategic European transport network which allows fast movements of consignments and provision of data. The CroBIT system provides railways a toolset to achieve better visibility, enhanced service reliability and customer service.

One of the fastest growing transport industries is trucking, in part because IT encourages “just-in-time” inventory management. Meanwhile, market share for rail freight transportation is at 8% and has been steadily declining for three decades. This trend can be reversed, in part, by the effective application of information technology.

Railway freight traffic was at a disadvantage against other modes of transport because of the unavailability of operational data on international transports. Due to the inability of network partners to share critical event information, much of the tracing and tracking applications relied on manual processes. These manual processes inhibited the goals of interoperability as specified in the Technical Specification for Interoperability (TSI) – EU directive 2001/16/EC. CroBIT is designed with an architecture that respects the processes and data exchange defined in TSI for European Interoperability.

Therefore CroBIT will address the following problems:

- how to improve the co-operation across borders between the different players in a transport chain?
- how to obtain accurate real-time information on the location and status of the payload?
- how to provide continuous data on the train and select necessary activities?
- which value-added services not available today should be offered?
- which IT structure is favourable to achieve higher levels of performance and cost-efficiency?

Basically a consignment being transported along a chain must be:

- preceded by data (to identify it and to ensure its treatment by different players needing their respective lead times);
- accompanied by data (to identify and monitor it on route);
- followed by data (to summarise events, to report on history, to prepare invoicing, to discharge the carrier).

Other data can be used to perform other rail

**Objectives:**

The objective of this project is to develop, test and evaluate solutions:

- for improved service reliability and data exchange;
- for cross border freight trains;
- in a corridor of the Trans European Rail Freight Network;
- using advanced IT-Technologies.

A short look on the actual state-of-the-art will help to better understand the intended innovations to be achieved for border crossing freight trains especially. The crossing of a border is always accompanied by an interchange between Infrastructure Managers (IMs) and often also by a corresponding change of the Train Operating Company (TOC). Latest at interchanges a data exchange between IMs and TOCs
occurs. For the infrastructure the data exchange between IM1 to IM2 of the neighbouring railway is needed for the execution of train operations, i.e. the traffic management.

It consists of messages:

- on train composition,
- delays, interruptions,
- running schedule,
- rerouting and
- special event related messages.

Ideally this is performed in accordance with UIC leaflet 407.

TOCs also perform a data exchange aiming at the management of the transport of goods with wagons (using UIC 404-2). For this purpose messages have to be exchanged which relate to the following groups:

- technical characteristics of the wagon
- characteristics of the goods transported
- characteristics of running under load
- characteristics of a train or a set of wagons
- shutdown information for wagons
- information about delays.

**Methodology:**

The work aims at a gradual introduction of the IT service platform with a stepwise connection of the stakeholders. As a first step the need for services and data exchange between IM – IM, TOC – TOC and IM – TOC will be analysed and helpful services (applications) shall be realised. The communication with customers and authorities remains unchanged. In principle it is well known, which applications are necessary for an efficient border-crossing traffic and transport management in the rail mode. UIC leaflet 407 contains most of the necessary applications for IMs at interchanges and 404-2 in a similar way those for the TOCs.

The new aspect to be realised here as opposed to the state-of-the-art is the central and parallel availability of relevant data to all TOCs and IMs as soon as one of them has put in his information. This results in much longer lead times. Here only those data will be exchanged which would be exchanged in any case, but no longer in a serial way from one TOC (respective IM) to the neighbouring one. The communication needs between IMs and TOCs e.g. on train delays, train composition, rerouting, rescheduling, and other specific works are conceptualised in UIC 407-1 (draft), which will serve as a basis for the realisation of the data exchange between TOC and IM via the intermediate platform(s).

With this platform only for IMs and TOCs confidentiality problems will not yet arise and have not to be taken into account in this phase of work. But the communication between the stakeholders of the railways is no longer bilateral and serial but star-like and parallel with a central service platform. It has to be ensured, that the stakeholders are connected to the platform via converters. The reason is, that these converters will enable the railways to further use their in-house systems, which have been expensive and offer their specific advantages. The converters shall be built for the demonstration of the concept by partners in the project, because this is not the preferred business of railways. For a demonstration at a border-crossing, converters for two TOCs and two IMs will be needed. They can also be used in the next phase, when the final service platform is built up with the additional integration of customers and authorities.

The second step towards the final service-system deals to a great extent with confidential commercial data being interchanged between TOCs, customers and authorities. Therefore in this step a concept has to be introduced.

**Parent Programmes:**

- FP5-GROWTH KA2 - Sustainable Mobility and Intermodality

**Institute type:** Public institution

**Institute name:** European Commission, Directorate-General for Energy and Transport (DG TREN)

**Funding type:** Public (EU)

**Partners:**

Finland:
TØI Institute of Transport Economics; VR Finnish Rail; VTT Technical Research Centre of Finland
France:
NESTE(AR) Nouveaux Espaces de Transport en Europe (Application Recherche); UIC Union Internationale des Chemins de Fer

Germany:
IITB Institute of Information and Data Processing of Fraunhofer Society; EK Ekonsult; SGKV STUDIENGESELLSCHAFT FÜR DEN KOMBINIERTEN VERKEHR e.V.; ST star/trac supply chain solutions GmbH; DBS Deutsche Bahn Systems

Portugal:
CP Caminhos de Ferro Portugueses EP

Switzerland:
ICF Intercontainer/Interfrigo

Organisation:
Fraunhofer Society for Applied Research in Natural Sciences (FhG), Institute of Information and Data Processing (IITB)

Address: Fraunhoferstrasse 1
Zipcode: 76131
City: Karlsruhe
Contact country: Germany
Telephone: (+49) 89 120 55 94
Fax Number: (+49) 89 120 56 42

Key Results:
- Facilitated data exchange and information integration by using a state of the art message broker. Partners can use their existing data formats and protocols
- Assured data quality through centralised compliance checking and data enhancement
- Customised alert and reporting functions based on user-specified parameters
- Flexible reporting and query functions on the Consignment, Container, Wagon or Train levels
- Enhanced Trip and Timetable Monitoring
- Flexible, user-defined delivery systems: on-line interface, E-Mail, SMS, EDI or direct feed into the user's existing system
- Enhanced information on delays, departures, waypoints, arrivals
- ETA functionality

Technical Implications

Reduction of delivery cycle:
- online incident reporting shall compress the time and improve opportunity for more precise scheduling of border crossings;
- online linkup of interline RUs shall enhance chances to trace and track loaded and empty units in motion and at rest;
- online communication between infrastructure managers shall lower margins for scheduling and departure/arrival errors;
- sending/receiving waybill or proof of delivery via internet shall create an alternative to manual processing of consignment delivery documents;
- communication between several RUs shall improve inter-rail interoperability and cut down the total haultime.

Reduction of transaction and labour costs:
- frequent updates on load movements between different RUs shall improve contingency planning, reducing costs and penalties caused by delays;
- access to CroBIT database shall increase utilisation levels of available rolling stock and load
carrying capacity. This can provide significant increases in fleet utilisation and loaded cycles;
• online communication between upstream and down-stream interline RU providers shall reduce the frequency of unwanted incidents and the need for extra resources to cope with higher cost of delivery;
• online communication can reduce transaction and labour costs by reduction of manual paperwork handling, reduction of errors and by providing timely and accurate information;
• online incident reporting and traffic monitoring provides for more efficient planning for the upstream transportation providers.

Policy implications

CroBIT is a new system that gives the railways a tool to track consignments and calculate ETAs for their traffic throughout Europe. Railways, logistic service providers, transport operators and – most importantly – their final customers get more information than today’s existing international systems can offer. This will increase the railway’s competitive ability and meet the demands of complex supply chains. CroBIT offers more features and services than today’s bilateral international systems and provides the “value add” that is necessary in the competitive environment. CroBIT concedes open access to all European Cargo Railways, integration capabilities and state-of-the-art-security.

CroBIT is able to integrate freight railways along a transport corridor. Participants deliver information to the CroBIT-System where it is processed. Partners can then receive up-to-date, mission critical information. Information may be retrieved on consignment, container, wagon or train level depending on the user’s requirements. CroBIT is able to distribute its information automatically via predefined interfaces or via the CroBIT website. The aim is to provide total shipment visibility.

Documents:
- CroBIT Final Report Public.pdf (Final report)

STRIA Roadmaps: Network and traffic management systems
Transport mode: Rail transport
Transport sectors: Freight transport
Transport policies: Decarbonisation, Societal/Economic issues
Geo-spatial type: Network corridors