



Operations



Operational Decision Support System

Sharing of information between the railway actors to manage the effects of service disruption

Integration of information is the key for further growth of railway transport volume. Decision makers will be able to make better decisions once they have the right information at hand about their own processes and about the processes of their partners in business. InteGRail is the project that developed an enabling technology to allow universal access to existing information systems, be it databases, monitoring systems or existing user applications. For this purpose InteGRail defined a standard approach for architecture and communication. Using this standard approach a number of example applications were developed. One of these applications is an Operational Decision Support System (ODSS). This is designed to support a traffic manager who needs to interact and exchange information with other railway actors to manage the effects of service disruption.



What is ODSS?

ODSS is a tool which will provide a procedure to be manually or automatically executed when a unplanned event occurs. This will be achieved through the following tasks:

1. Acquisition of alerts and alarms through the InteGRail communications architecture
2. Applying reasoning to the collected data to identify the actual scenario and to estimate the possible disruption to the operation; the scenario is selected inside a knowledge base,
3. Identify rules and procedures to be followed to minimise the possible scenario disruption; it will require an appropriate knowledge base;
4. Interacting via the InteGRail communications architecture with existing and new systems to exchange required information with all actors involved in the decision making process
5. Proposing a set of possible solutions for to be evaluated and shared by all actors. The best solution will be selected.

The design of ODSS responds to a survey of user needs, and railway partners in the InteGRail project have contributed to the workflow and process analysis.

Who can benefit?

Infrastructure Managers and Railway Undertakings will benefit from a reduction in train delays, through better management of the response to unplanned events.

How is the benefit realised?

In the present railway situation, a traffic manager is unaware of a problem on a train or in the infrastructure until he observes that train delays are occurring. The response to the event then relies on a lot of direct interaction by telephone, fax or email between the traffic manager and the railway undertaking's controllers, who do not all have access to the best information to make a decision.

The InteGRail communications architecture will allow intelligent monitoring and maintenance systems to recognise actual or incipient faults that will impact on railway performance, and raise an alert to ODSS before the traffic disruption results. The sharing of this information will allow much earlier recognition of the unplanned event, and a better prediction of the consequences. ODSS will then facilitate the use of external traffic management tools such as a Traffic Re-scheduler to plan a response to the event, and the negotiation of a preferred solution through the electronic exchange of information between all the railway actors involved. The expected result is quicker and better decision making, with a reduction in train delays and faster restoration of the full train service.

Present status, availability and future possibilities

A prototype of ODSS has been implemented for InteGRail Demonstration Scenario 3 "Fault on a High-speed Train". In this application ODSS has been interfaced with an Unplanned Event Manager and a Traffic Re-scheduler developed by different partners in the InteGRail consortium, to demonstrate the interfacing of separately developed tools through the InteGRail communications architecture. To illustrate the process of negotiation between the railway actors, the demonstration includes simulated interfaces to the Operator Resource Planner tool of a railway undertaking, and the Path Management System of another Infrastructure Manager.

The Demonstration takes place in Autumn 2008 using a Euro*City train of Trenitalia running on the RFI network in Italy.

Other results of InteGRail

Architecture definition of integrated information systems: IGRIS

Semantic data structure of the railway domain, the InteGRail ontology

Example user applications: ODSS for on-line operational decision support, IAC for on-line infrastructure availability, IDT for on-line vehicle maintenance information

Description of interdependence of performance of railway processes: the railway KPI tree, and a tool to assess and visualise performance

InteGRail - Facts and Figures

InteGRail started on 1/1/2005 and ends on 31/12/2008

Total project budget:
20 million Euros

EC funding : 11 million Euros

Total effort over 125 person-years

39 partners from 11 countries

Partners of InteGRail:

UNIFE • Alstom Transport • AnsaldoBreda • Bombardier Transportation • Siemens Mobility • UIC • Trenitalia • D'Appolonia • TSB-FAV • DeltaRail • ATSF • CAF • Nortel Networks • Laboratori Guglielmo Marconi • FAR Systems • MER MEC • Italcertifer • ATOC • České dráhy • MAV • UNICONTROLS • Strukton Railinfra • Deuta-Werke • Heriot-Watt University • IMEC • OFFIS • Televic • Seebyte • Kontron • University of Chile • INRETS • Wireless Future • University of Birmingham • ADiF • RFF • ARGE Corridor X • Network Rail • ProRail • SNCF

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