INTElligent inteGration of RAILway systems

Sustainable Surface Transport
Project Number FP6 012526

Project Presentation

IGR-I-IQM-024-09
ERRAC Vision at 2020

- To cope with the increased transport demand in Europe, railways must:
  - Triple rail market volumes*
  - Double rail market share*: 15% for freight and 12% for passengers

*compared to the year 2000
Facts and Figures

- **Duration:** 48 Months
- **Commencement Date:** January 1st, 2005
- **Partners:** 39 from 10 EU Countries + Chile
- **Budget:** about €20 million
- **EC Contribution:** about €11 million
- **Labour Effort:** more than 1500 Person Months
InteGRail consortium
InteGRail Mission Statement

InteGRail aims at creating a holistic, coherent information system, integrating the major railway sub-systems, in order to achieve higher levels of performance of the railway system in terms of capacity, average speed and punctuality, safety and the optimised usage of resources. Building on results achieved by previous projects, InteGRail will propose new intelligent procedures and will contribute to the definition of new standards, in compliance with EC directives and TSI’s.
InteGRail expected impact

- **Improve reliability by up to 50% for targeted systems by optimised maintenance**
- **30% availability improvement and irregularities reductions**
- **Reducing maintenance costs by 10%**
- **InteGRail could bring up to 5% increase in punctuality**
- **Contribute to increased capacity in line with ERRAC objectives.**

### Activities

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**ERRAC Strategic Agenda Objectives**

**EC White Paper Objectives**
InteGRail approach

Overall performance

Performance subsystems:
- Fleet
- Operations
- Traffic Management
- Infrastructure

Key Performance Indicator examples:
- Reliability
- Availability
- Maintainability
- Safety
- Punctuality
- Timetable Realisation
- Safety
- Punctuality
- Timetable Realisation
- ....

Reliability
Availability
Maintainability
Safety
Business model
Project Structure

SP1 - Management
Dissemination
Evaluation
Training
Academic
coord.

SP2 - System requirements, architecture
and continuous assessment

SP 3A - Intelligent
System Monitoring
and Control

SP 3B - Intelligent
System Maintenance

SP 3C - Intelligent
System Management

SP 3D - Advanced
System Communication

SP4 - System Integration, test and Validation
InteGRail remit

- InteGRail will enable information to be shared within the Railway World to enable optimisation of decision making for improved performance.
- It will identify the information that is needed to be shared (SP2)
- It will ensure that the right information can be obtained (SP3A)
- It will identify ways of using the information more effectively for maintenance optimisation (SP3B)
- It will identify ways of combining and using information effectively for management requirements (SP3C)
- It will ensure that the information can be transmitted effectively to the decision makers. (SP3D)
- It will demonstrate that creating the right information and sharing it will enable performance improvement (SP4)
- InteGRail will NOT replace existing systems. It will be used in conjunction with existing systems.
InteGRail Scope: The System Context

- **HS TSIs for OPE, CCS, RS, ENE and INFRA**
- **CR TSIs for OPE, CCS, RS, ENE and INFRA**

**InteGRail**

- **SP 2** – System requirements, architecture and continuous assessment
- **SP 3A** – Intelligent System Monitoring and Control
- **SP 3B** – Intelligent System Maintenance
- **SP 3C** – Intelligent System Management
- **SP 3D** – Advanced System Communication
- **SP 4** – System Integration and Validation

**ModTrain**

- MODUSER
- MODPOWER
- MODBogie
- MODCONTROL
- MODLINK

**EuRoMain**

- EDDN

**TrainCom**

**InteGRail**

**SEDPTSI Telematic Applications for Freight Services**

**FIRE**

- Ecotrack

**ERIM**

**SafeRail**

**Infraclear**

**EUROPAC**

**FMAN**

**INTELFRET**

**EUFRANET**

**SEDP**

**C ATIEMON**

**UIC leaflets**
INTElligent inteGration of RAILway systems

Project Process

User needs
System Spec
Architecture / Design
Prototypes Development
Prototypes testing
System integration
System validation

Users
+ Industry

Industry
Cooperation between subprojects
InteGRail general deliverables

- **InteGRail will deliver the specification of a standard platform and protocol in order to interface existing or new information systems, so as to enable exchanging key information between subsystems, which are needed to improve the performance of the railway system.**

- **To have the RIGHT information in the RIGHT place at the RIGHT time.**
  - 1 – Specification of information sharing
  - 2 – Development of a protocol language as standard using Ontology and QoS oriented Telecom resources
InteGRail Scope: European Railway Scenario

- Coordination of Traffic & Maintenances
- Management of Risk
- Manage Operation Performance
- Networks operated “Locally”
- Cooperation on Maintenance & Traffic Mngt
- Risk & Performance
- Monitor KPI

European Railway Scenario
INTElligent inteGration of RAILway systems

The converging process

YEAR 1
Infrastructure
- I1 Safety
- I2 Availability
- I3 LCC
- I4 Capacity

YEAR 2

YEAR 3

YEAR 4
Functional Requirement Specifications

Railway Domain
KPI Needs
- Requirements
- Functions
- Scenarios
- InteGRail System Definition
Implementation phase

Technology Domain
- Information
- Ontology
- Knowledge
- Services
- General Architecture mapped to SP3x

03/12/2008
Project presentation
Generic system architecture viewpoint

- Traffic management
- Operation management
- Infrastructure

IGR Backbone (ISG)

- KPI computation
- Common data model
- Service directory

Common Core Services

FCA

IGR Portal

Rolling Stock
The way ahead

Integrated function selection in line with Demo Scenarios

First iteration of subsystem design

Internal integration in the subprojects

System integration

Pre-demonstration

Demonstration

Final reports

2007

2008
Conclusion

- InteGRail: an integrated system for integrated railways
Thank you for your kind attention

More information on: www.integrail.info