Intelligent Integration of Railway Systems
Poster Description

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This poster will contain a description of the InteGRail project, Intelligent Integration of Railway Systems. InteGRail is a Europe wide, European Commission funded project that has 39 stakeholders representing all of the main industry players. The list includes operators, suppliers, maintainers and technical advisors such as Universities.

The poster will contain an introduction to the project highlighting the main objective of the work. The objective of the project is to develop a trans-national, Europe wide, integrated railway system. The aim to meet this objective is to create a **holistic, coherent information system** to integrate the major railway subsystems and deliver a higher level of coordination and cooperation between the key railway processes by intelligent information sharing. It is believed that the result will be an integrated system that will facilitate the improved information sharing and provide decision support. It is considered that the key aspects of this work are interoperability based on a common railway ontology as a basis for standardisation.

The experience gained in previous integrative projects is being used to identify key challenges for higher level semantic and ontological information sharing areas and define specific areas where improvements can be made. These improvements are based on integrating existing information systems to gain the maximum value from information. The problem areas are believed to lie in the integration of heterogeneous technical systems that rely on different terminology without appropriate self-descriptiveness. On an ontological level the capture and integration of the domain experts view is relevant.

In consideration of these challenges the solution is believed to lie in the creation of models to represent domain concepts and their related attributes, in the form of on-line ontological representation of measurements within this virtualisation of the perception of real-world sensor information. The capture of the expert's knowledge (based on scenarios) will then be used to create sequences of description logic queries that implement the system services based on distributed reasoning. . The sensor data will be mapped on-line to the models where it can be classified to identify a situation e.g. condition based monitoring, and provide appropriate system actions and activities.

Initial work with onotology and reasoners has resulted in the development of example railway domain ontology. Ongoing work and discussions with experts will yield more comprehensive models displaying the strengths of this approach over traditional database/data warehouse implementation.

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