

ONTOLOGIES FOR RAILWAYS

IT INTEGRATION USING ONTOLOGIES



In today's highly diverse IT landscape, the integration of ad hoc applications can provide extensive issues when handled incorrectly.

This is particularly true in cases relating to essential functions, such as; asset management, maintenance, operations, pricing, ticketing and legal matters. The poor management of this can generate very high lifecycle costs and, as a result, prevent you from leveraging the value of your data.

Ontologies cure data "silozation"

This complex array of IT operating systems within the railway industry can often result in data being stocked in siloed sub-systems which are unable to communicate with one another.

Ontologies allow for this issue to be resolved without the barrier of a complex integration process. This approach of using semantic centralized integrations allows a significant reduction in the total lifecycle integration costs by a factor of 5-15. Not only that but once the ontology is in place, it allows for limitless extensibility as it acts as a glue between the vertical railway solutions performing essential business functions.

A cost effective agile answer

The ODASE™ platform offers an agile, zero defects and cost effective solution where business and IT are aligned on the basis of a semantic model: the ontology.

- Formal and machine executable
- Ease of use for those from both business and IT backgrounds
- Allows for explicit specifications in the areas of
 - Concepts
 - Properties
 - Axioms
 - Rules
- Functional independent of any implementation technology
- Preventive testing ensures seamless integration



Test, Explain, Change... Early

A defining step in the creation of the ontology is the testing process which includes the analysis of 'what-if scenarios' and the explanation of inferred results. This process allows for the identification and correction of system errors or inconsistencies in the model from the first instance. This ability to resolve possible issues without waiting for the integration phase creates an efficient and effective process that protects the essential functions that are central to the railway industry.

ERTMS Solutions was founded in 2008 and is located in Brussels, Belgium. We are a world leader in railways testing, maintenance and systems integration product tools, especially known in the ERTMS world. We are working with many key actors of railway signaling: Manufacturers, Rail Infrastructure Managers and Operators.



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3 Dimensions, 3 standards

- A design-time interactive development environment, “ODASE Workbench”, to create, edit, test and explain rules conforming to the SWRL W3C standard
- A compile-time API generator making the ontology (OWL, RDF, SWRL) usable by software developers using Java or C#
- A run-time environment, “ODASE Platform” to build and execute ontology-centric applications

Ready-to-use connectors

- ✓ SQL DB (Oracle, ...)
- ✓ Graph DB
- ✓ SAP
- ✓ Mainframe MQ
- ✓ Services (WS, REST)
- ✓ JSON-LD
- ✓ XML
- ✓ Angular
- ✓ Microsoft Excel



OWL

- Web Ontology Language
- Concepts in description logic

RDF

- Resource Description Framework
- Triples: subject – predicate - object

SWRL

- Semantic Web Rule Language
- Declarative Business Rules, in logic

Customers' references

"We have seen the results of ERTMS Solutions' ODASE™ platform on a proof of concept, which didn't leave room for doubt. When complex systems must be integrated, this solution is future proof, agile and cost effective."

Eric Casillas, Goal Systems, Sales Director



"What you need if you are going to adopt ontologies is very-easy-to-use-tools that let the people who already understand the software in those areas, use the semantic web technology without needing to be specialist, and that's what the Odase tool let you do."

John Easton, University of Birmingham

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ODASE

