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Interoperable data Program

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The Interoperable data program aims to achieve harmonization in the data structures maintained by the Agency and beyond, by means of developing the ERA Ontology: Railway organisation and companies must adopt this data format for data provision to certain registers (such as the Register of Infrastructure) and can extend accordingly to cover their use cases, leveraging semantic interoperability for aggregating their (most possibly) separated information systems.



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ERA Ontology

Enables semantic interoperability to regulated use case data that need to be accommodated in registers.



Aggregate data

From different sources, transform once into the semantic model

Benefit



Consolidate knowledge into the Ontology and invest for future agile development.



Data centric Organisation

Data as a service





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REG+

The user platform for accessing the ERA KG.

ERADIS+

Safety & Interoperability documents: diverse content and workflows. Common characteristic that their evidence is a signed document.

VKM+ E

Joint OTIF/EU VKM Register is hosted by ERA and provides the VKM details in four languages

ERATV+

Types of railway vehicle authorised by ERA or the Member States.

Anything+

OCR+

Organisation Codes allocated by the Agency to all interested parties, operating in the European Railway system.

EVR+

Vehicle registrations, including vehicle numbers.





Data silos Limited interoperability Manual Copy&Paste **Data duplication** Low data quality High maintenance and operations cost **Proprietary solutions** Vendor lock-in

* Back to the Future is owned by Robert Zemeckis and Bob Gale









Linked data **Excellent interoperability** No manual data-operations **Global golden record** High data quality **Reduced maintenance and** operation costs **Open standards – Open source** Data sovereignty

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Upstream legal interoperability





Enable new queries



Sources: LOD project - Publications Office, GraphDB visualisation

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Challenges

Data quality dimensions

- Completeness
- Manual data provision and validation, prone to human error
- Undefined content (other, additional information, comments, etc.)
- Missing identifiers among different content types
- Complexity of existing database structures
- > Data or information infused in the application logic
- Complexity of organisations' data
 - Errors, typos, small differences
 - Duplicate or not? Merging among different data sources
 - Missing unique identifier, Organisation code optional or not existing
 - Historical evolution



RINF

Infrastructure description





Backbone of the ERA Knowledge graph

Characteristics - Layered a

- Topology model (micro (provides routing)
- Lines geometry
- Geographical and temp
- Railway subsystems de but goes beyond, inclu
 - Appendix D1 Ro
 - Appendix D2 Ro
 - Appendix D3 ET

Telematics - Primary an
Schematics (for Route
Organisations' data



eferencing systems





Route book pilot project

- > Capture requirements.
- > Propose digital route book interface.
- Publish and make available APIs, apart from existing querying endpoint, to foster developments by interested parties.
- Analyse and validate the elements description in TSI OPE Appendix D2. Publish all related findings.



Telematics TSI

Technical documents development > Telematics Ontology

The draft Telematics TSI introduces the concepts of findability, accessibility, interoperability and reusability in data exchanged via messages in telematics applications.

- Draft telematics ontology derived from current XSD schemas and code lists.
- Aggregates Primary and Subsidiary location codes used in telematics applications with infrastructure description.
- Proposes APIs for exchange of data stored in a single source of truth.
- Broadens the scope of Organisation Code to consolidate with Company Code.





RINF

Accessibility data

Service facilities description



Network statement elements



Single rules database

Today it is a separate description of National rules in the form of text, together with some structured information.

In the future, we can have a semantically enriched description, using the ERA Ontology as the "vocabulary" to draft the text.



Registers in service



As long as no new solutions are implemented, the legacy systems are in operation and are demanding in resources:

- end user support;
- technologies lifecycle.

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