

EXECUTIVE SUMMARY

This document describes the Interoperability Framework's "development environment", i.e. a secure, stable and expandable set of tools, frameworks and utilities used for:

- development of the Interoperability Framework technical demonstrator;
- proof-of-concept integration testing with other components of the IT2Rail project;
- execution of the overall IT2Rail overall pilot implementation;
- further development activities in the continuation of the full Shift2Rail IP4 program.

The document describes therefore *tooling* available for development, but it is not – in this respect – a description of the Interoperability Framework's *design* or *implementation*. The latter is documented in deliverable D 1.6 "Proof-of-Concept Packaged Resolvers Core Features".

The elements of the development environment have been identified through a selection process based on previous results from another Artemis R&D project, SOFIA (Smart Objects For Intelligent Applications), participant partner's available tooling and qualitative and quantitative experimental tests performed on open source frameworks, in order to identify them according to the following criteria:

1. Support the design concepts and assumptions documented in the D7.2 Development readiness pack deliverable [2];
2. Limit development effort to the specific *research and innovation* contents of the IT2Rail project, selecting standard tooling for standard tasks such as managing connectivity, persistence, web service development and conventional data manipulation;
3. Consistently with the overall objectives of the IT2Rail Project, eliminate any dependency on proprietary or specialty technology, in order to allow for any alternate choice of implementation of the same specifications, choose tools available under open source licensing policies;
4. Select tooling widely known and used by participating partners in order to reduce to a minimum, or eliminate altogether, training and support requirements;
5. Conform to general Horizon 2020 / Shift2Rail regulations, the Grant Agreement and the Consortium Agreement.

The remainder of this document is organized as follows:

- Chapter 1 describes the main objectives and features of the Interoperability Framework considered as drivers in the selection of the tooling for the development environment of its technical demonstrator. The subsequent chapters describe tooling selected to implement the features based on the selection criteria listed above;
- Chapter 2 describes SOFIA2 as the platform of choice for the runtime environment of the demonstrator;
- Chapter 3 describes the tooling selected for implementation of an Asset Manager, e.g. the Ontology Repository;
- Chapter 4 describes the ontology editor selected;
- Chapter 5 describes the choice of Triple Store technology;
- Chapter 6 describes the RDF programming framework;
- Chapter 7 describes utilities for linked data;
- Chapter 8 describes the selected Integrated Development Environment for code developing, testing and distribution.

The Asset Manager, Ontology Repository, Semantic Web Service Registry and Triple Store are components of the Interoperability Framework described in more detail in the documents listed in the Referenced Documents section at the beginning of this document.