SEMANTiCS
Amsterdam 2021

3rd International Workshop On Semantics And The Web For Transport (Sem4Tra), Semantics 2021

Enabling Cross-Border Travel Offers Through National Access Point Federation via Metadata Harmonisation

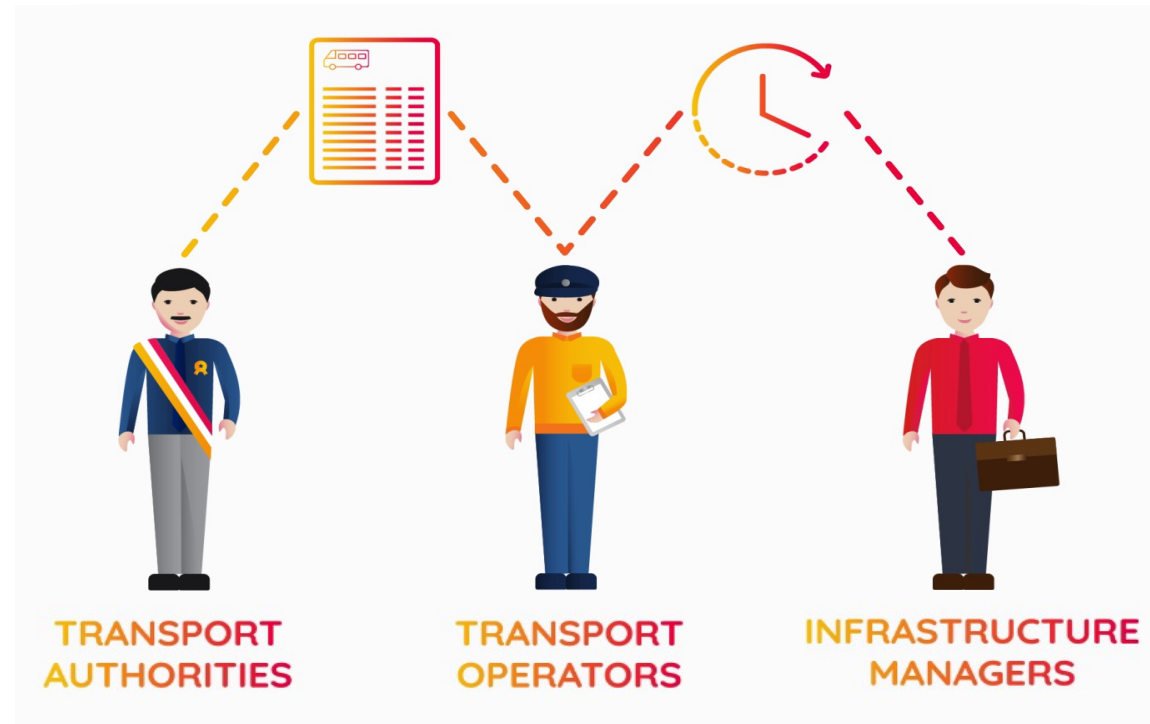**Alessio Carenini,** Andrea Fiano, Mario Scrocca, Marco Comerio and Irene Celino

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1. **National Access Points for Multimodal transport data**

2. **The Winter Olympics scenario: gathering timetables across EU**

3. **NAP metadata mapping**

4. **Prototype**

5. **Conclusions**

Provision of EU-wide Multimodal Travel Information Services

- Each EU Member State to set up a **National Access Point (NAP)**, for multimodal travel information for all transport modes (air, train, bus, ferry, metro, tram, car/bike-sharing, car-pooling, etc.)

- Transport Stakeholders should contribute to the NAP with their **static** and **dynamic** data

- The regulation identified **Standard Data Formats:** *NeTEx*, *SIRI* and *DATEX II*

TRANSPORT AUTHORITIES   TRANSPORT OPERATORS   INFRASTRUCTURE MANAGERS

The scenario: going to Winter Olympics

Trenitalia wants to create mobility packages to bring as many tourists as possible to Milano-Cortina Winter Olympics.

To achieve the goal, they must check as many timetables as possible across EU to create «corridors» and integrate the information with locally-managed transport information.

Trenitalia could retrieve such information from the National Access Points, but while EU mandates standard formats for data interchange, nothing is mandated about metadata. As a result, each NAP implementation adopts a different metadata scheama, limiting interoperability while searching for datasets.

We selected three NAPs, and demonstrated that their metadata can be harmonised and aggregated in a single federated catalog.

Le Point d'Accès National aux données de transport

Belgium's national access point for multimodal travel information services.
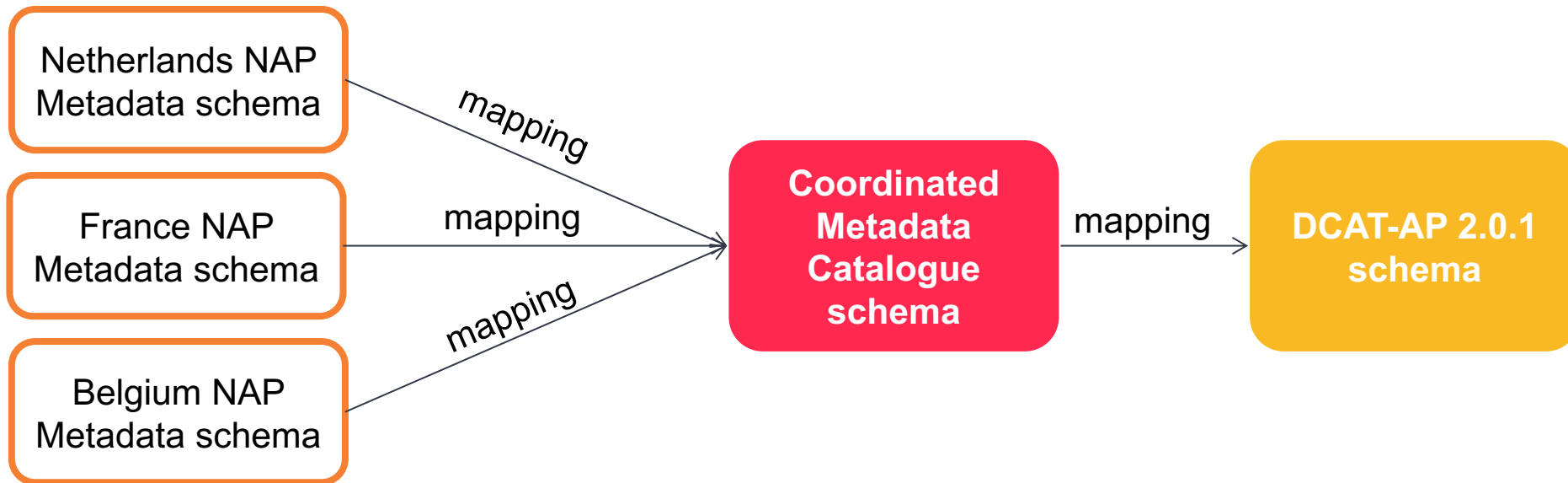
Nationaal toegangspunt ITS

We exploited the metadata harmonization work done by the "Coordinated metadata catalogue" initiative

NAP Metadata schemas were mapped onto the Coordinated metadata catalogue schema, and then to DCAT-AP 2.0.1

Asset Manager

A shared catalogue of distributed digital assets

- Enforces governance of an ecosystem, providing workflow-based processes to review, create versions and publish assets according to well defined roles and responsibilities.

- Provides a single source of truth for a digital transport ecosystem,

- Stores metadata about "assets" which can be reused to implement interoperability solutions (such as ontologies, data schemas and service descriptors)

In our scenario, Trenitalia hosts an instance of the Asset Manager to store
- Timetables
- API descriptions

The Asset Manager as an aggregator of trusted sources of data and metadata

An «open» ecosystem acknowledges the existence of other catalogues, which can be exploited either as a source of information or as a target for contributions
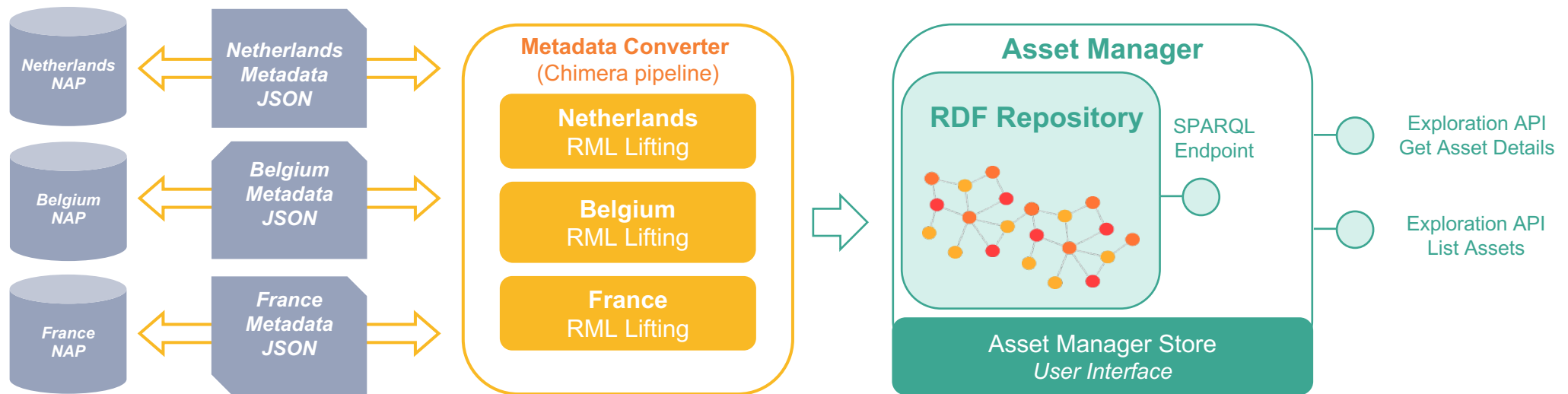
- Maintained by other initiatives / standardisation bodies
- Mandated by EU regulations
- Trusted data/metadata sources

The Asset Manager can be used to aggregate metadata from remote providers and to contribute asset descriptions to remote providers:

- Federate multiple instances of the Asset Manager
- Gain consolidated access to National Access Points across Europe

National Access Points integration: Metadata ingestion

- Metadata scraping from the NAPs
- Conversion to RDF using the mappings to DCAT-AP and the Chimera framework
- Storage as separate RDF graphs
- Asset Manager access via the Exploration API

National Access Points integration: Metadata quality

NAPs are often implemented using Open Data Portals

- Generic categories («road», «rail», …)

- No strict rules about the contents

- Automatic metadata ingestion leads to metadata quality problems

Human-based quality assurance

- Staff members of the Asset Manager must review NAP assets and approve their inclusion

- Users (both Consumers and Publishers) only see approved NAP assets

Conclusions

- National Access Points already provide a transport data ecosystem, trustable and mandated by EU regulations
- Converging to a common set of metadata enables new possibilities
    - Improved search capabilities
    - Automatic retrieval of relevant data and metadata
- We demonstrated that semantic technologies are ready to support such level of interoperability

- **Link a video** https://www.youtube.com/watch?v=SoOLheMv1wQ

from ideation to business value

Thank you
for your attention!

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