SEMANTIC TREEHOUSE

Shaping application profiles with STH

IDSA Tech Talk | 27 June 2024

TNO innovation for life

Contact

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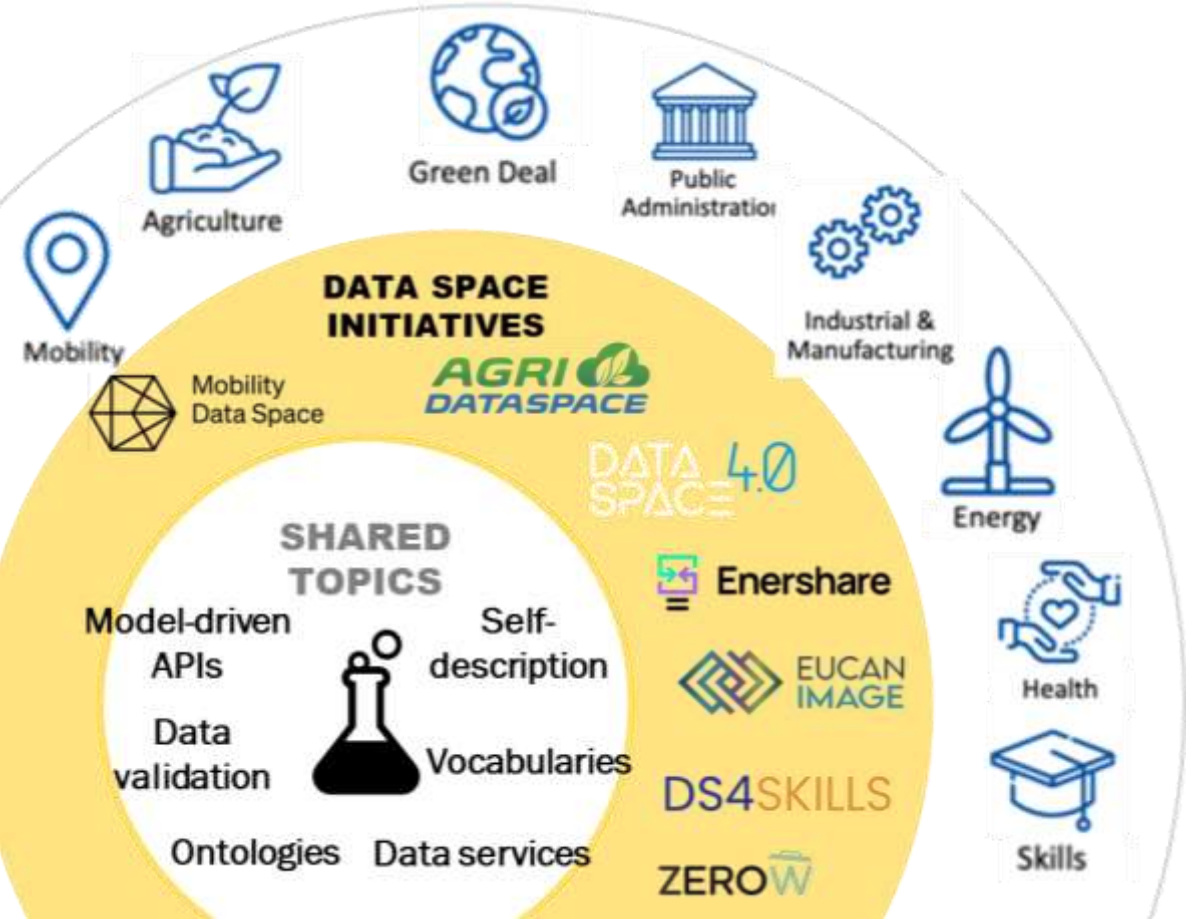
Relevant experience on Semantic Interoperability for data spaces:

- DSSC Expert on Data interoperability
- DSSC Task lead to develop the toolbox (catalogue of tools)
- Active in IDSA community
- WP lead in ENSHARE project; shaping a common European Energy Data space
- Steering group member of the PLDN community (network of linked data experts in NL)
- Product owner of Semantic Treehouse at TNO

Data spaces require solutions for data interoperability



DATA SPACES SUPPORT CENTRE

Business & Organisational Building Blocks

Business	*Governance*	*Legal*
Business model development	Organisational form & governance authority	Regulatory compliance
Use case development	Participation management	Contractual framework
Data product development		
Data space intermediary		

Technical Building Blocks

Data Interoperability	*Data Sovereignty & Trust*	*Data Value Creation Enablers*
Data models	Access & usage policies and enforcement	Data, services & offerings descriptions
Data exchange	Identity & attestation management	Publication & discovery
Provenance & traceability	Trust framework	Value added services

A vocabulary hub to support data spaces with data model use and -management

Semantic Treehouse

Online community platform
for **business & IT**
to work collaboratively
on **data models**

GitHub

Online
community platform
for **developers**
to collaboratively work
on **software**

SwaggerHub

Online
platform
for **developers**
to collaboratively on
APIs

Communities using Semantic Treehouse

Dutch sectoral initiatives and standard development organizations (SDOs)

KETENSTANDAARD BOUW EN TECHNIEK

SUTC

<-setu->

SCSN smart connected supplier network

NEN

STPE

European data space / data sharing initiatives

FEDeRATED NETWORK OF PLATFORMS

Enershare

dil

ZEROW

CIRPASS 2 Digital Product Passport

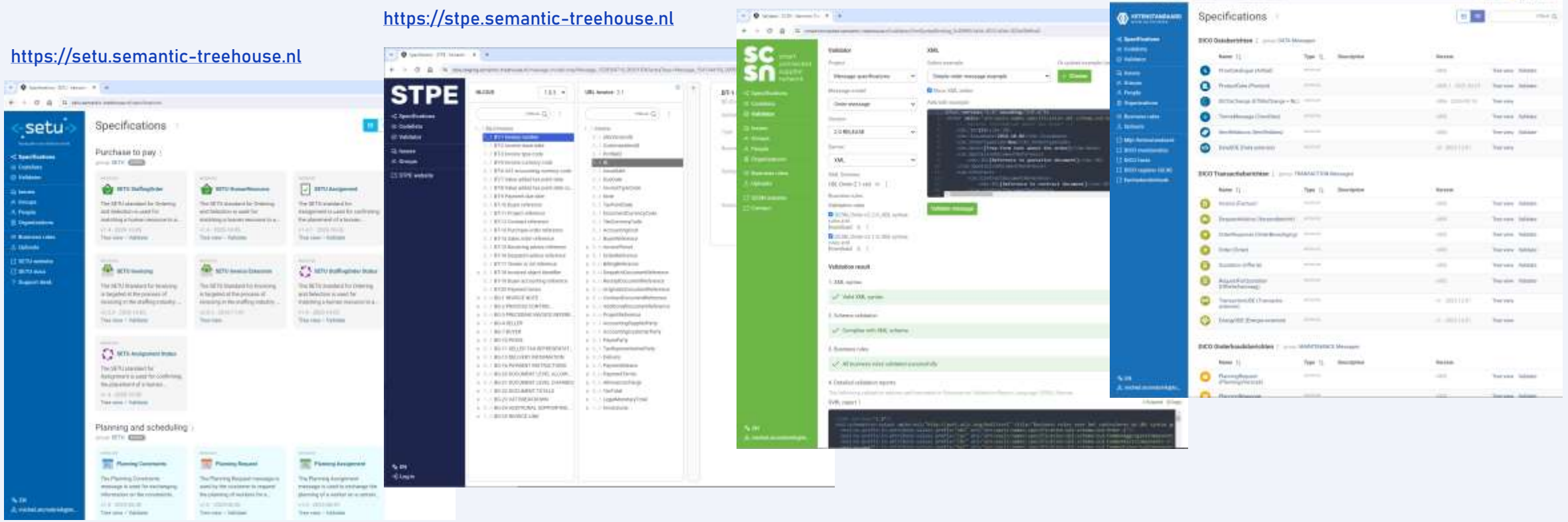
With STH we support SDOs with their data model management processes

https://setu.semantic-treehouse.nl

https://stpe.semantic-treehouse.nl

https://smartconnected.semantic-treehouse

https://ketenstandaard.semantic-treehouse.nl



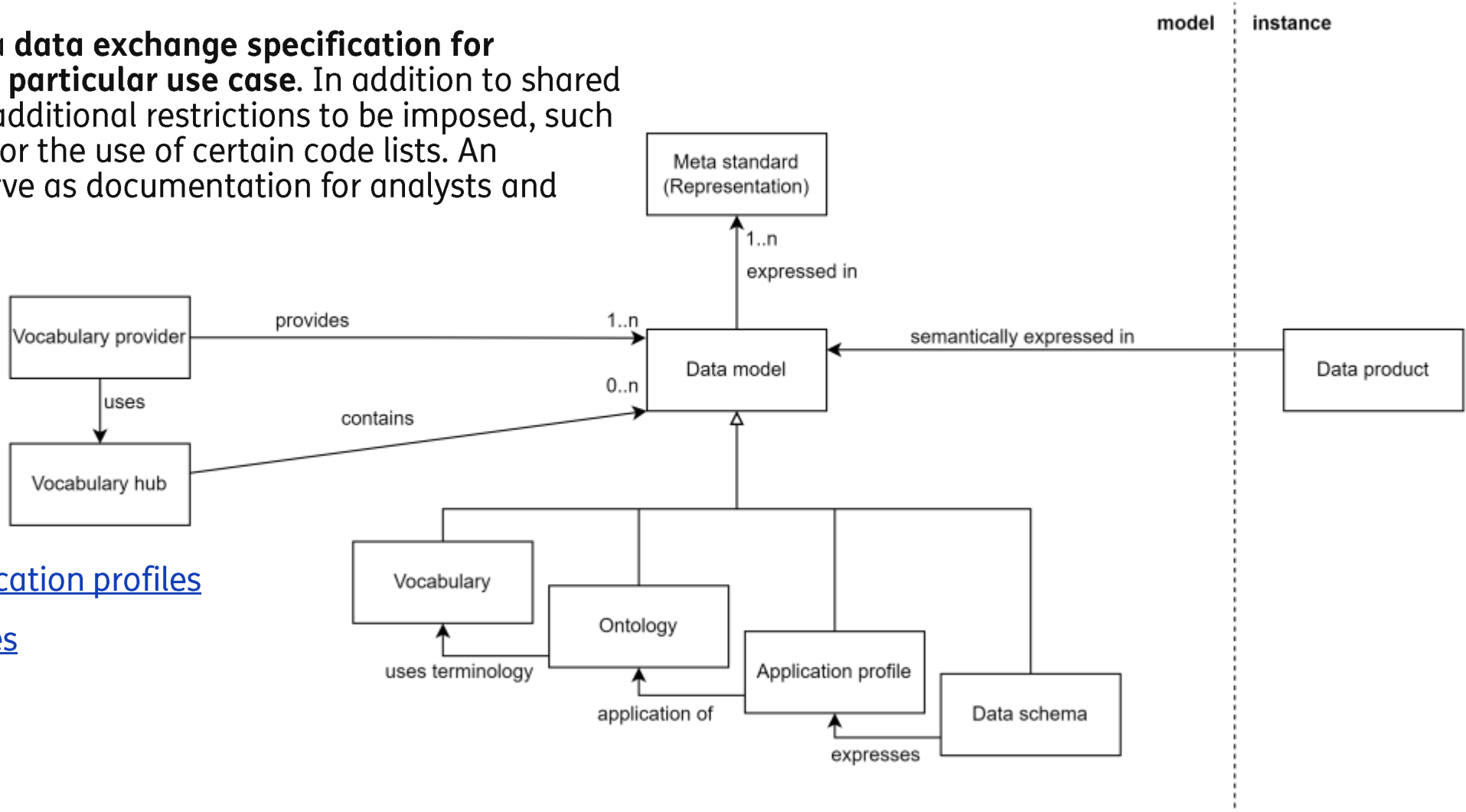
Testimonials: https://www.semantic-treehouse.nl/communities
List of user communities: https://www.semantic-treehouse.nl/docs/sth-communities

Application profiles

"An application profile is a **data exchange specification for applications that fulfill a particular use case**. In addition to shared semantics, it also allows additional restrictions to be imposed, such as recording cardinalities or the use of certain code lists. An application profile can serve as documentation for analysts and developers."[1]

Examples:

- DCAT-AP
- EN16931 CIUS
- Data Vlaanderen application profiles
- Open Trip Model profiles
- Many more...



1. Source: data.vlaanderen.be
2. Source figure: DSSC Blueprint v1.0 – Data models building block

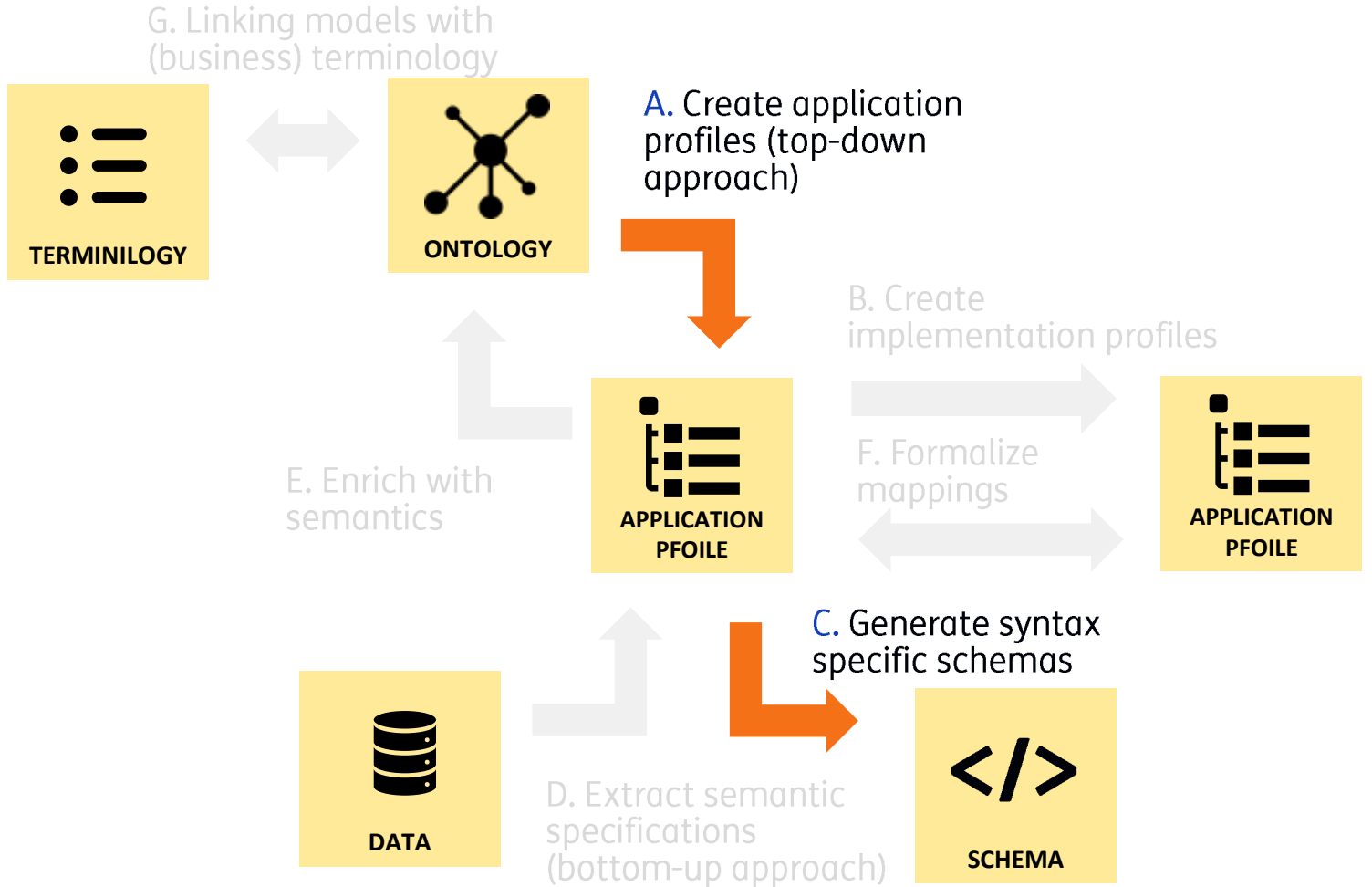
STH wizard to create, publish and maintain application profiles

We designed a wizard to:

- Lower barriers of using existing semantic models / standards
- Shape application profiles based on these semantic models
- Generate machine readable specifications according to open standards that can be used for software development (JSON schema, XSD, SHACL)

Learn more:

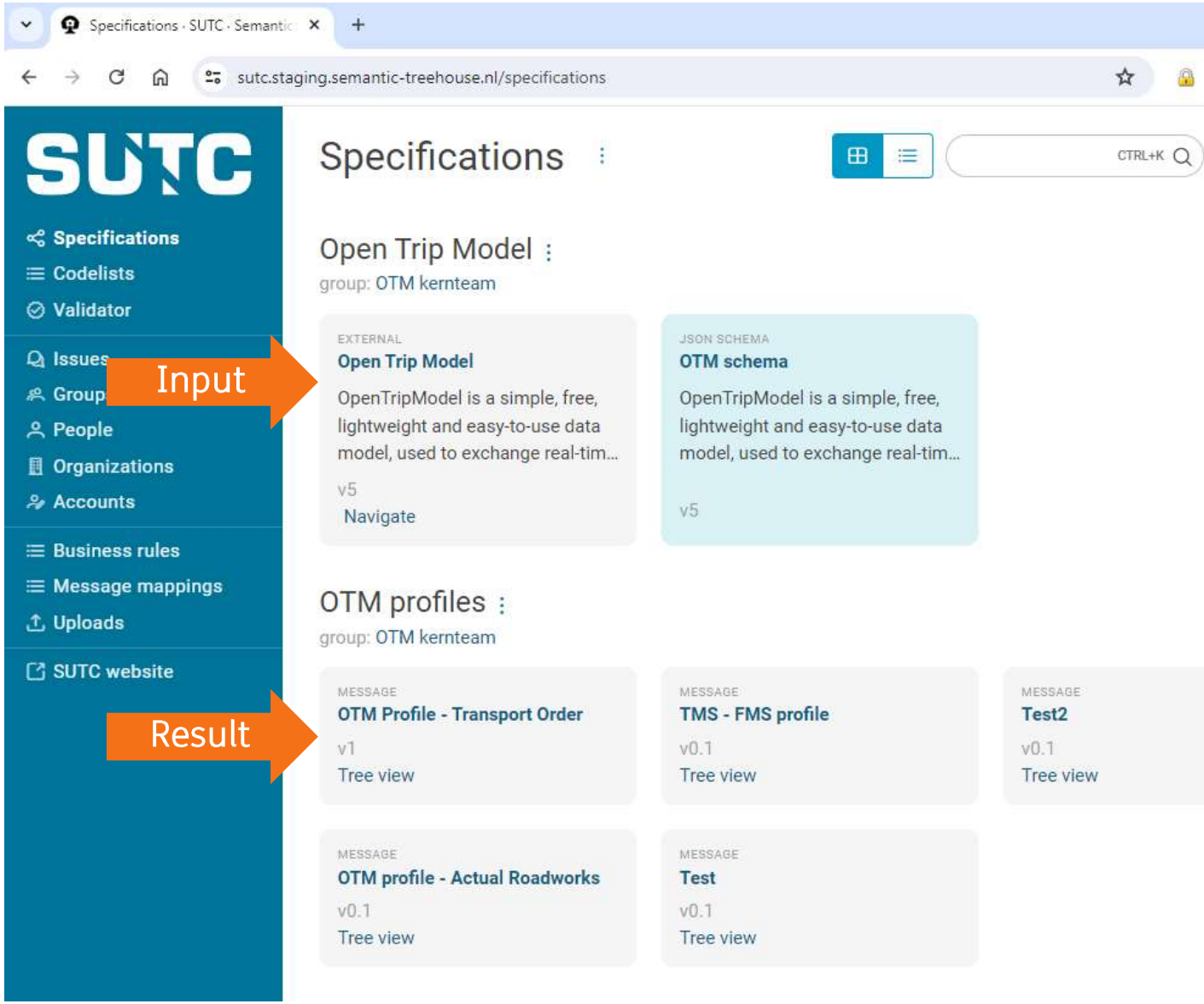
- Documentation about the STH wizard
- Support to use JSON schemas as input (the ontology/conceptual model)



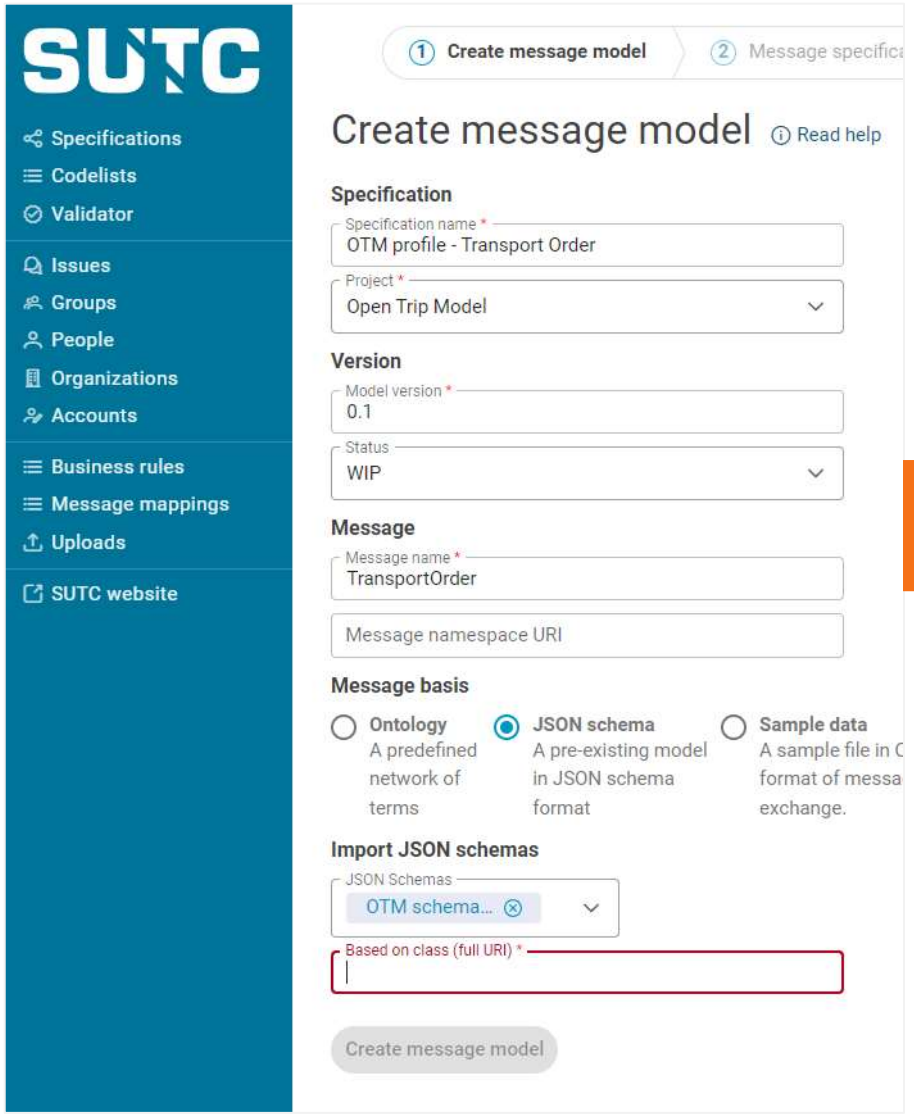
Use case 1: OTM Transport order profile

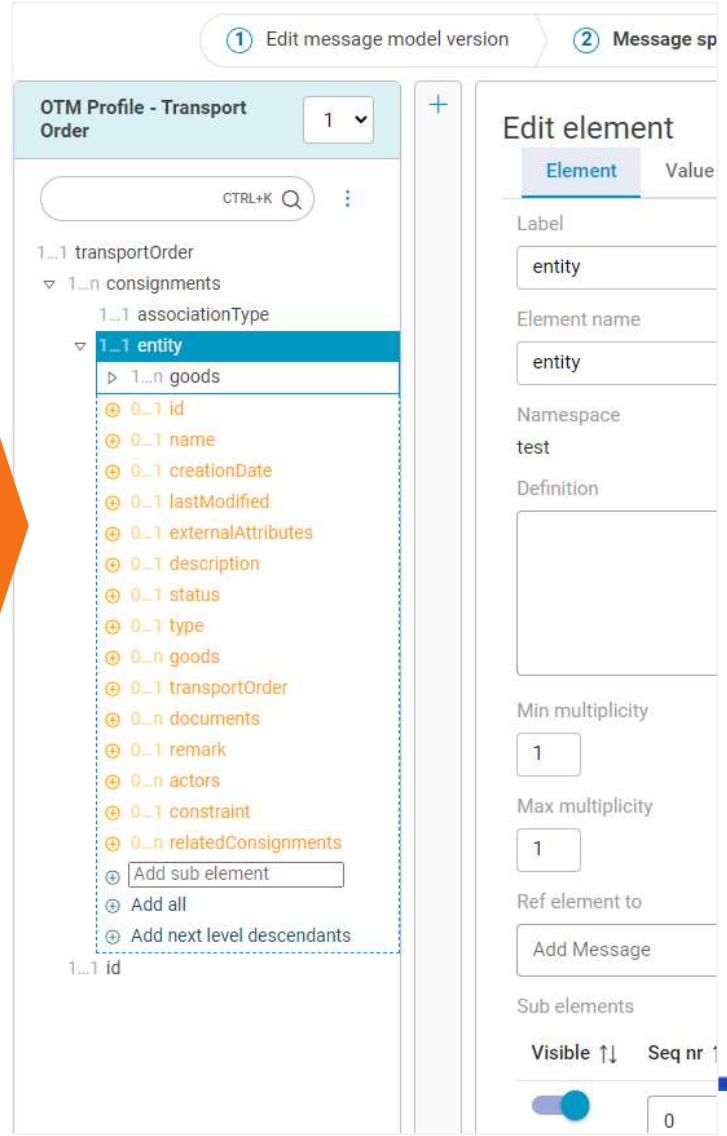
1. Reuse Open Trip Model
2. Create OTM profile for Transport order. Information requirement + constraints are articulated by group of stakeholders
3. Visualize as tree structure for human understanding
4. Export in machine readable format to adopt profile in tool chain. Format of choice is JSON schema
5. Configure validator for developers to check compliance

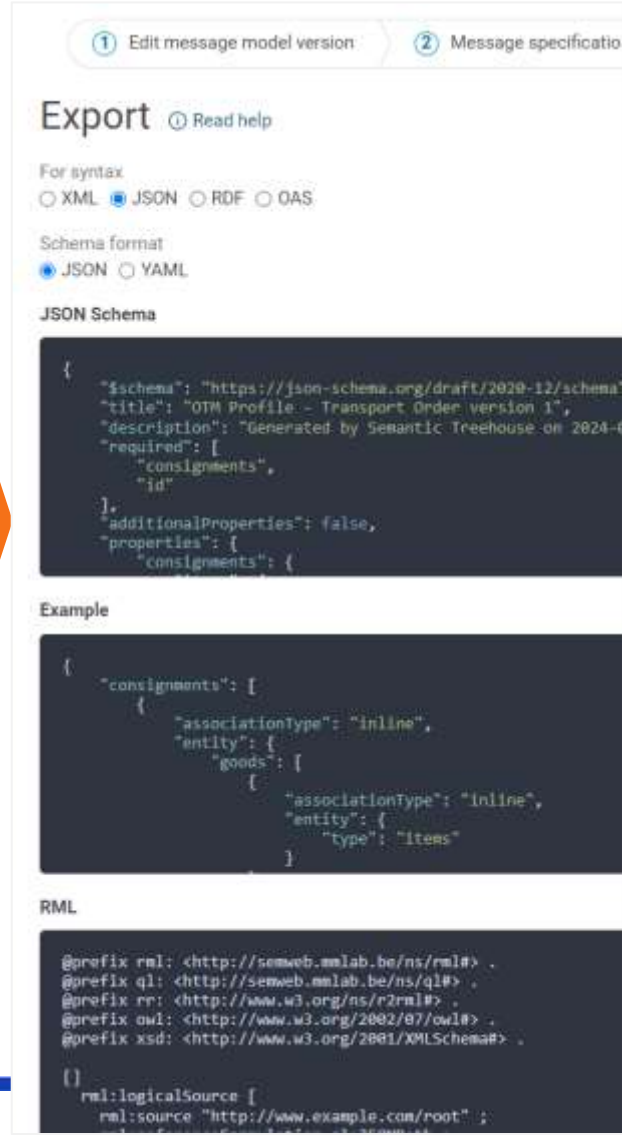
Live environment: https://sutc.semantic-treehouse.nl (You need access rights of *maintainer)*



Creating an application profile – 3 step wizard

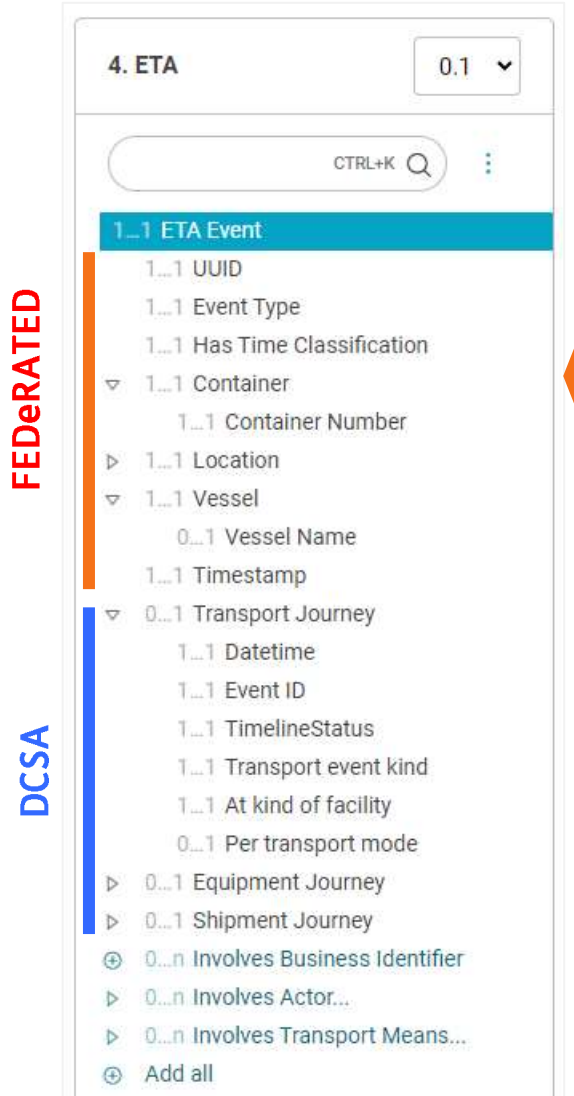


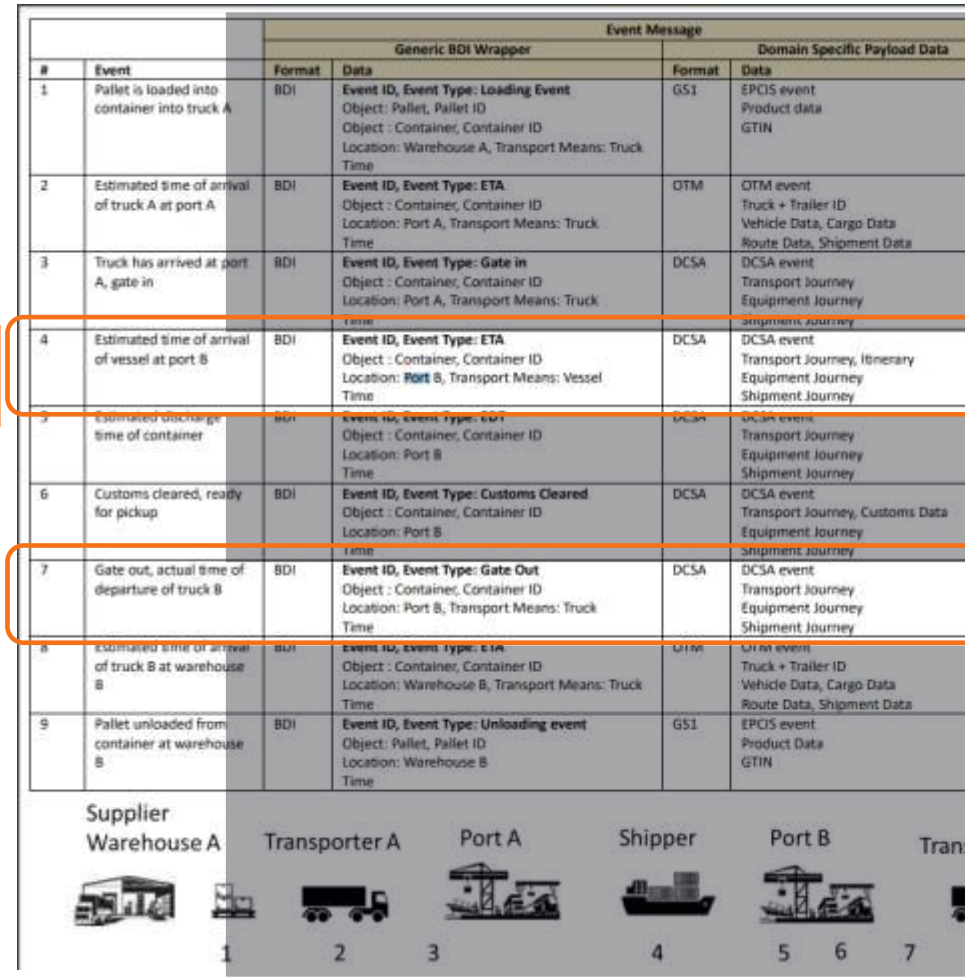




Use case 2: combining different semantic models from different SDOs

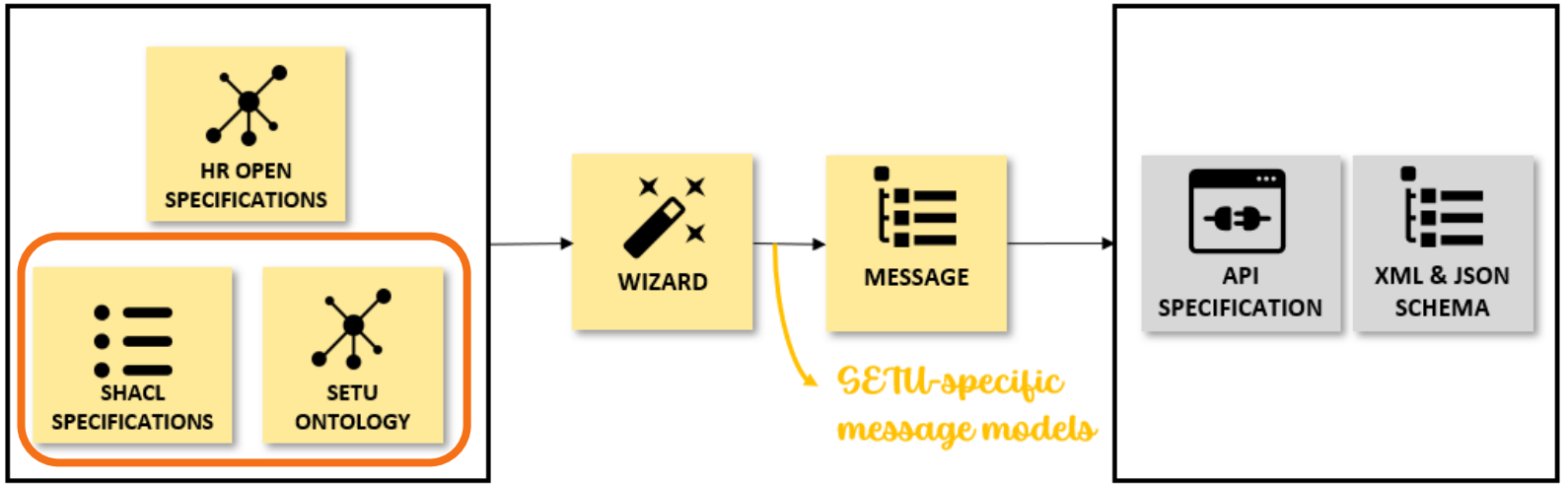
- Specify event message type for Estimated Time of Arrival (ETA)
- Combining generic wrapper and domain specific payloads
  - Generic: **FEDeRATED event**
  - Domain specific: **DCSA payload**
- Explicitly model the payload for these event types
- Output schema's for different syntaxes (including XML, JSON and RDF)
- Schema can be used in API specs to **configure data planes** (Dataspace Protocol)

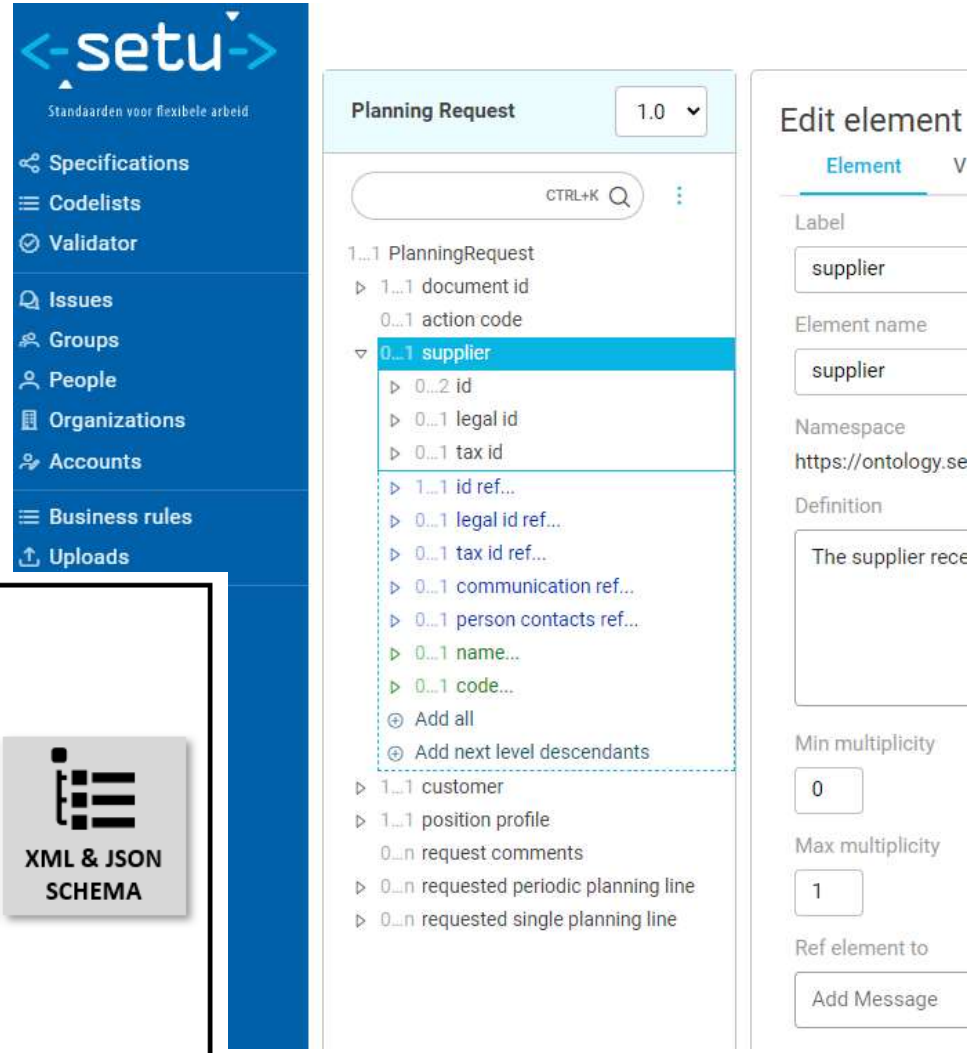




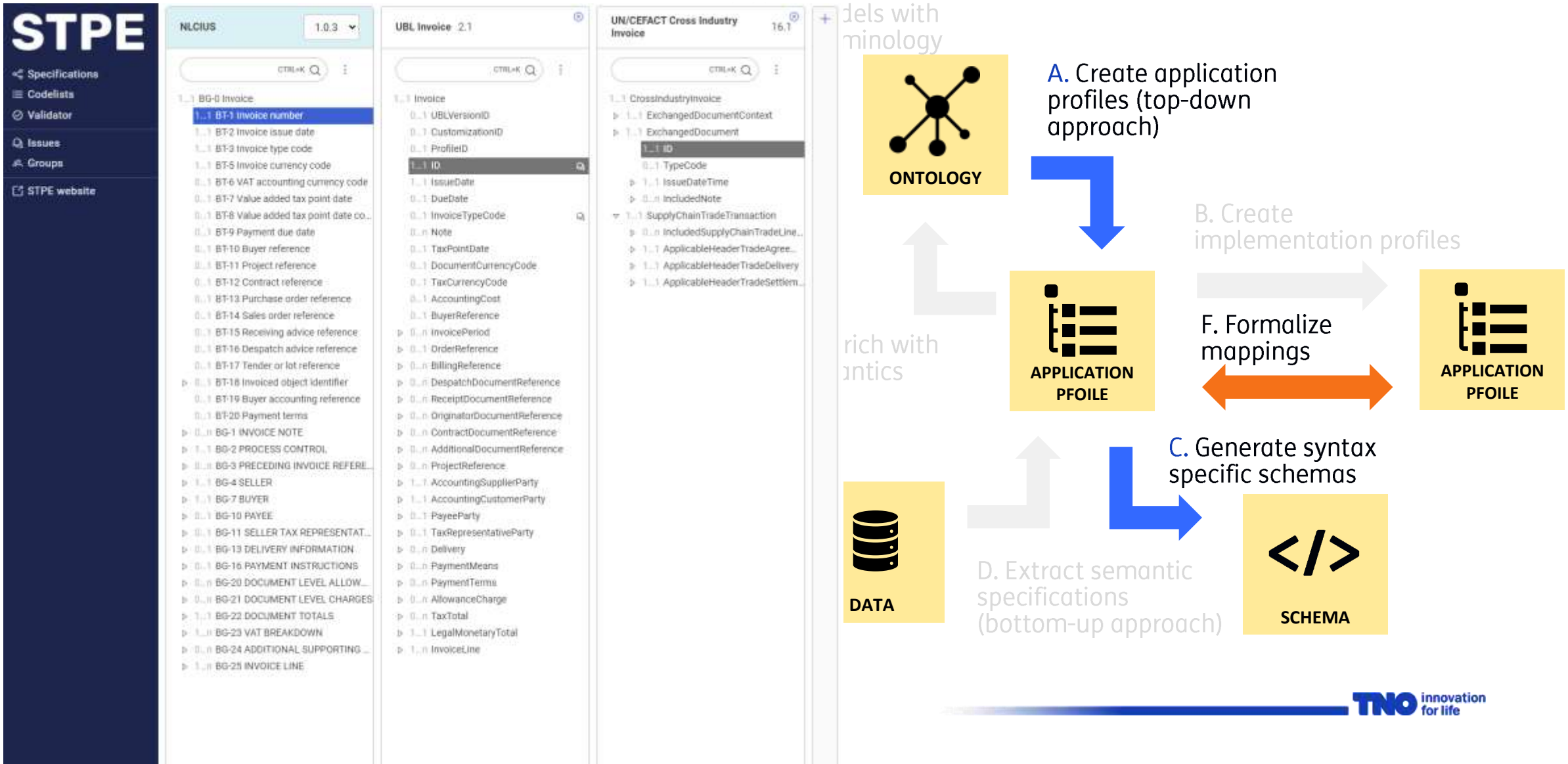
Use case 3: extending existing models with use case specific constraints

- Context: flexible staffing industry; **human resource planning** on a weekly basis.
- Required application profiles:
  - Planning constraints model
  - Planning request model
  - Planning assignment model
- Extending HR Open specifications + adding use case specific constraints.





One more thing: mapping to existing models



Want to know more about what Semantic Treehouse can bring for you?

- Documentation page: https://www.semantic-treehouse.nl/
- Testimonials by communities using STH
- Position paper + ENDORSE-conf recording on Vocabulary hub for data spaces
- Position paper on Sharing Vocabularies in Federated Data Spaces using DCAT
- Get in contact with the team via Discord → https://discord.gg/kdrbm9RUu8
- Last years IDSA Tech Talk on Semantic Interoperability

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Thank you

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