OntoTrans

Translator Tools

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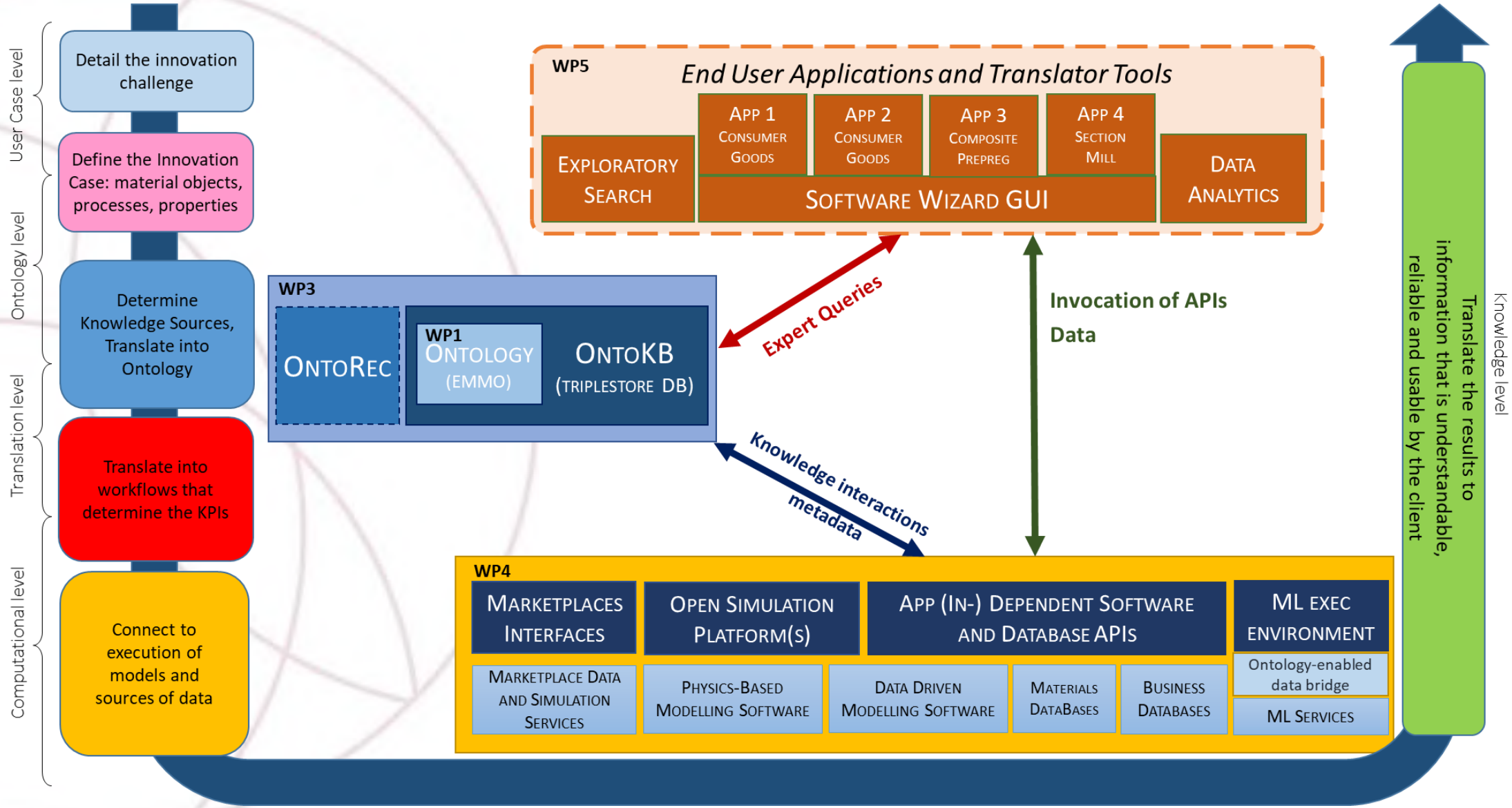

User Case level
Ontology level
Translation level
Computational level
Detail the innovation challenge
Define the Innovation Case: material objects, processes, properties
Determine Knowledge Sources, Translate into Ontology
Translate into workflows that determine the KPIs
Connect to execution of models and sources of data
WP5
End User Applications and Translator Tools
App 1 Consumer Goods
App 2 Consumer Goods
App 3 Composite Prepreg
App 4 Section Mill
Exploratory Search
Software Wizard GUI
Data Analytics
WP3
OntoRec
WP1
Ontology (EMMO)
OntoKB (triplestore DB)
Expert Queries
Invocation of APIs
Data
Knowledge interactions
metadata
WP4
Marketplaces Interfaces
Open Simulation Platform(s)
App (In-) Dependent Software and Database APIs
ML exec environment
Marketplace Data and Simulation Services
Physics-Based Modelling Software
Data Driven Modelling Software
Materials DataBases
Business Databases
Ontology-enabled data bridge
ML Services
Translate the results to information that is understandable, reliable and usable by the client
Knowledge level

Tools for Translators

Aims

- Further develop translator guidelines
- Bring evidence for best practices
- Ontologies to represent manufacturing challenges
- Build a semantic database of cases
- Learn from previous experiences
- Share knowledge semantically

Tools for Translators

- Common Graphical Framework
- Exploratory Search System (ESS)
- Data Analytics

Common Graphical Framework

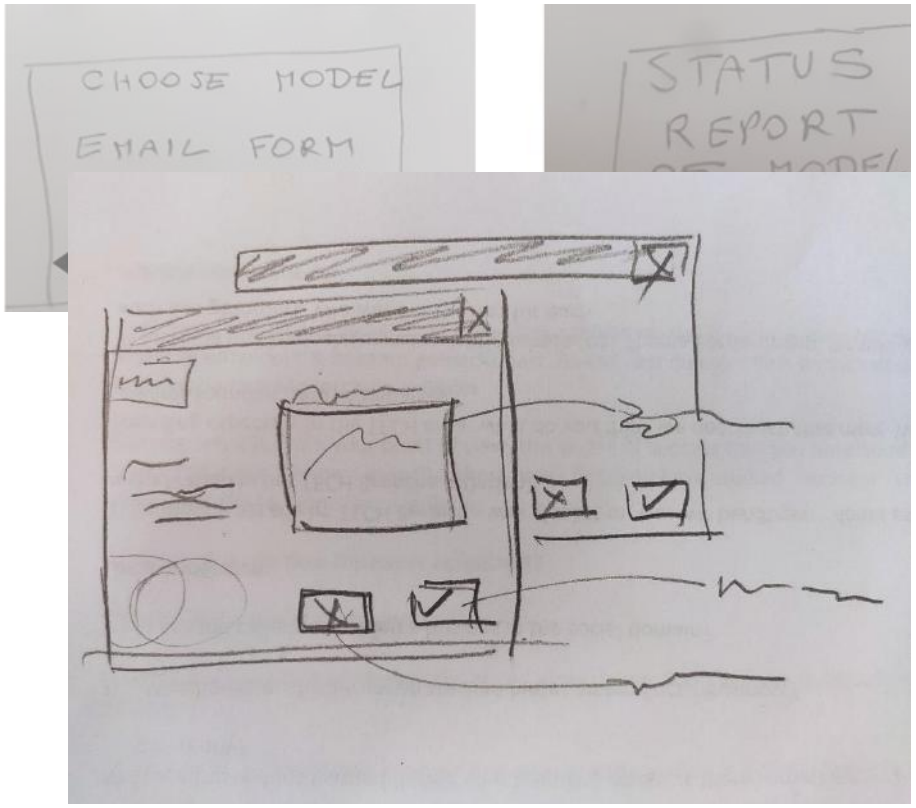
Use Case GUI development

- For each industrial application case
- User-friendly interfaces and use case dependent features:
  - Interfacing with OSP
  - Reasoning on data
  - Querying and browsing the data
  - Performing Data Analytics

Common Graphical Framework

Use Case GUI development

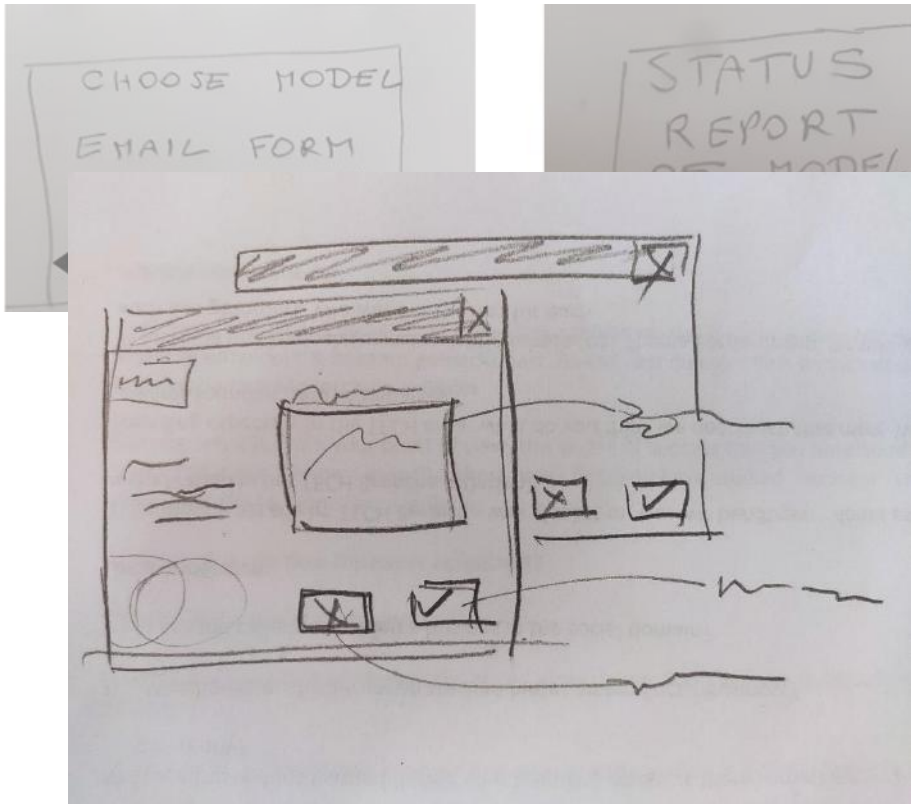
- For each industrial application case
  - customized workflow-based interface-wizard
  - non-expert users
  - (easy) starting point
  - case control interface for specific requirements



Common Graphical Framework

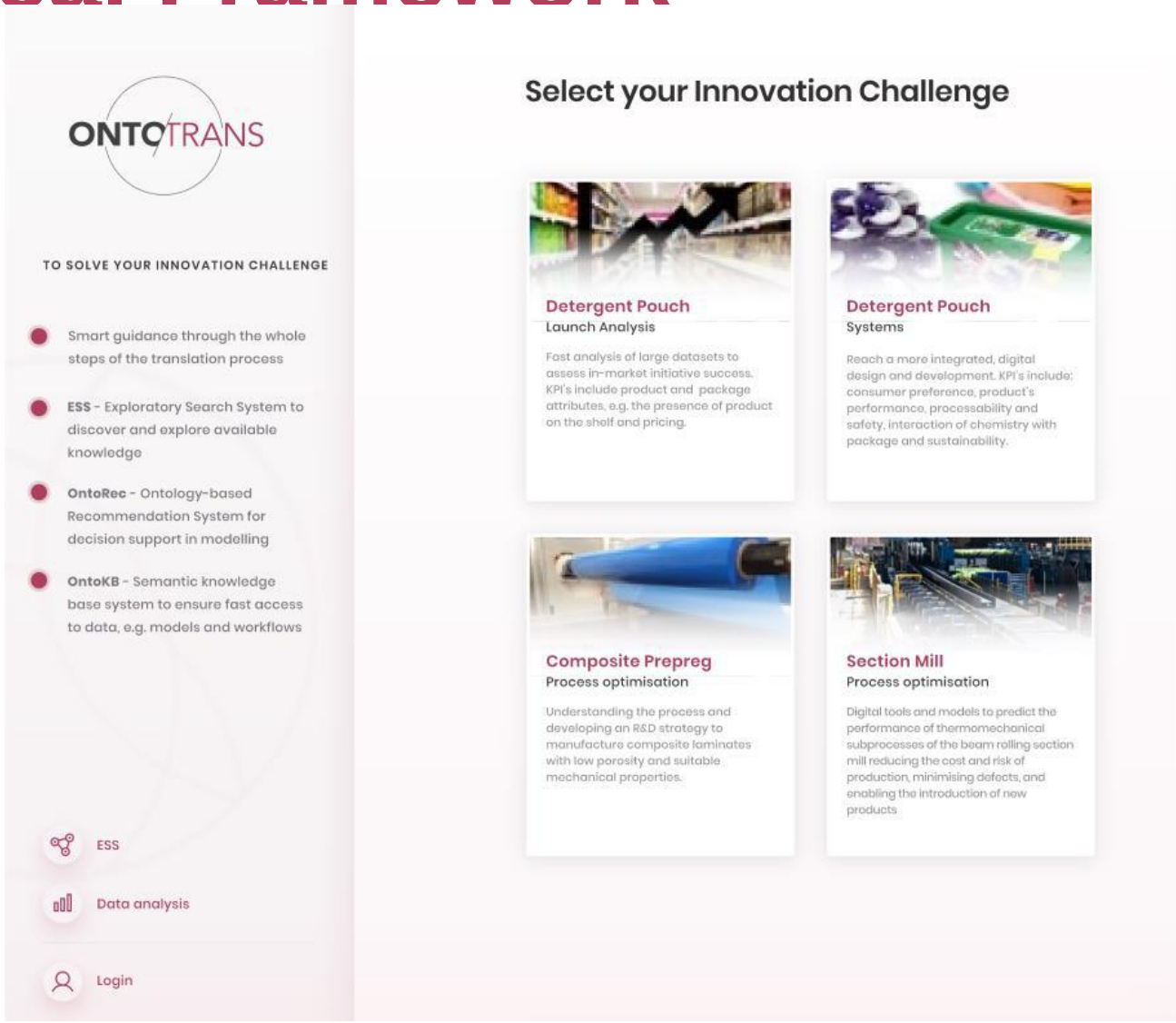
Use Case GUI development

- Collected requirements:
  - Pre-defined modules (for each use case)
  - Sequences of screens for user interactions
  - Web-based
  - APIs to and responses from
    - OntoKB, OntoRec
    - virtual MMM, Virtual BDSS
    - ESS, Analytics tools
  - (these are only a few)



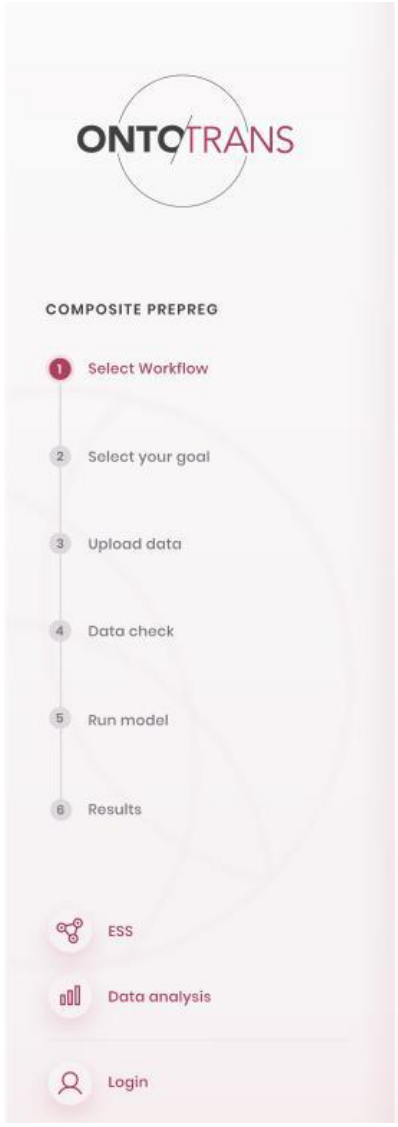
Common Graphical Framework

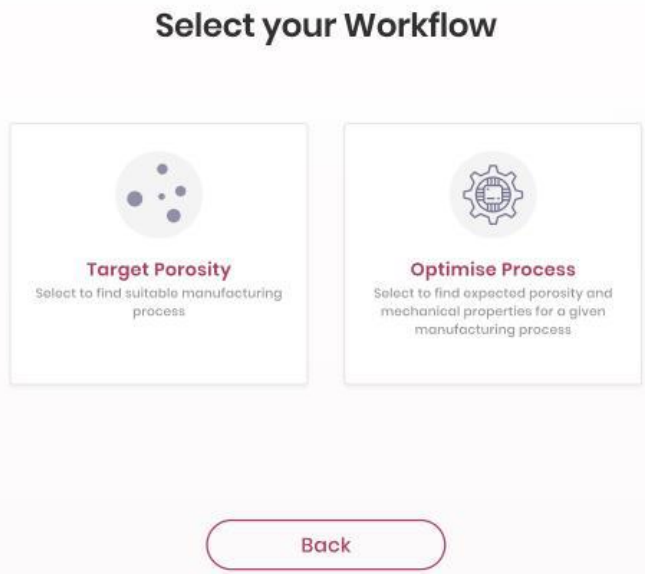
Design prototype



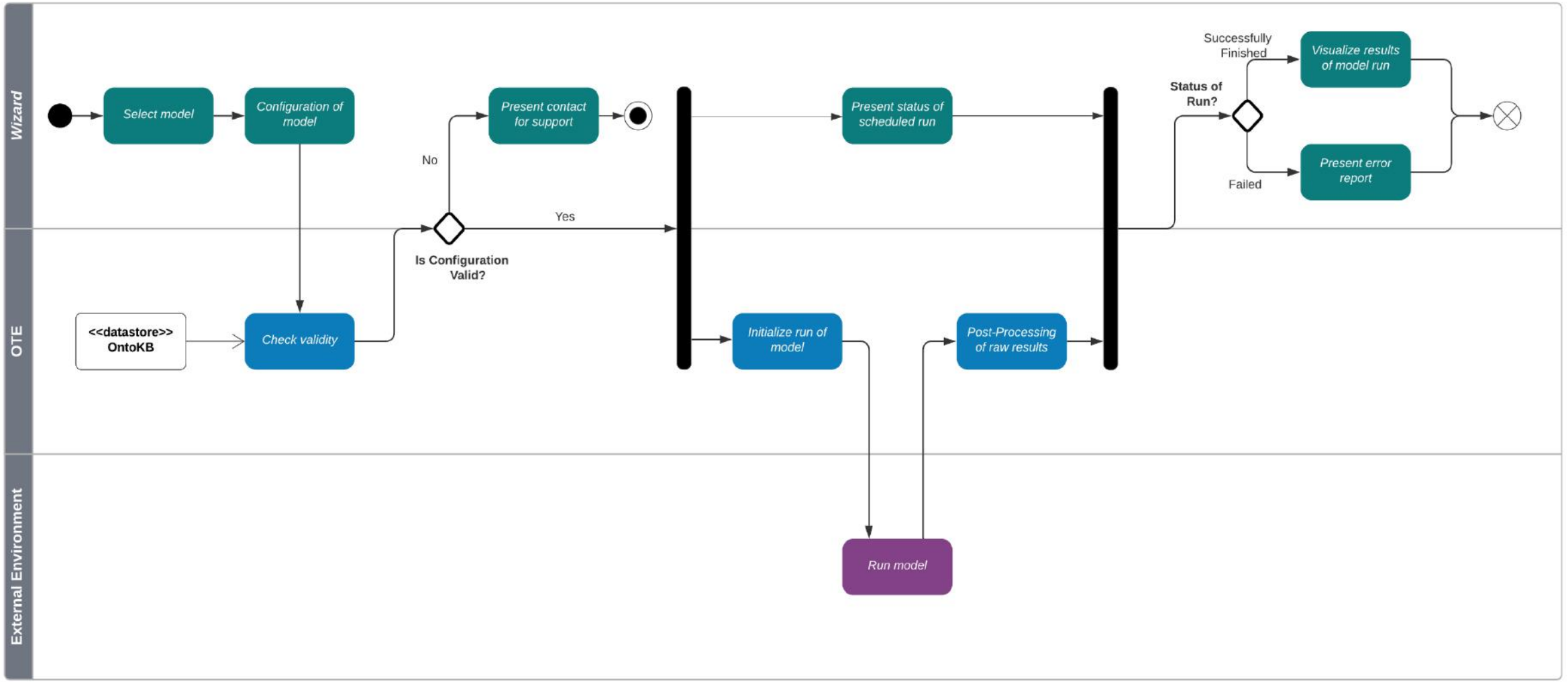
Common Graphical Framework

Design prototype





Common Graphical Framework

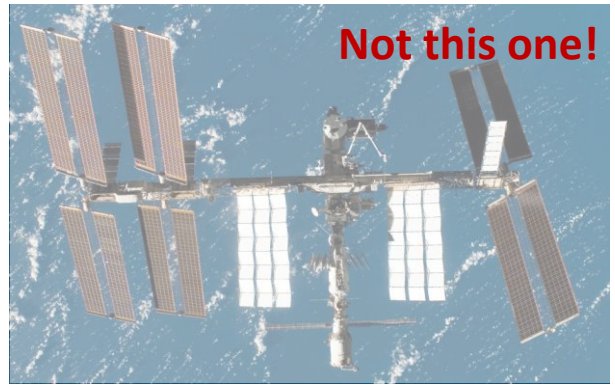


Tools for Translators

- Common Graphical Framework
- Exploratory Search System (ESS)
- Data Analytics

Exploratory Search System (a.k.a. ESS)

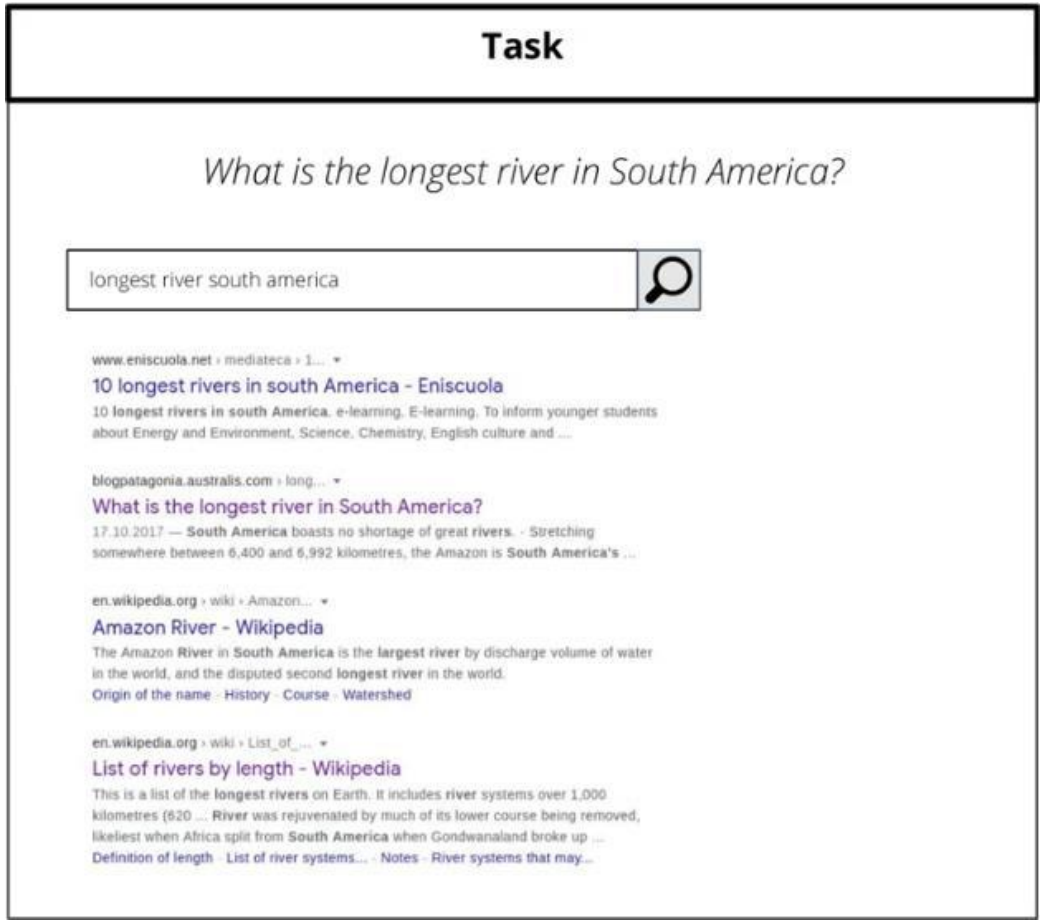
What is Exploratory Search?



Exploratory Search System (a.k.a. ESS)

What is Exploratory Search?

- Traditionally search:
  - query-response oriented
  - Good for well-defined information need / goal



Exploratory Search System (a.k.a. ESS)

What is Exploratory Search?

- Traditionally search
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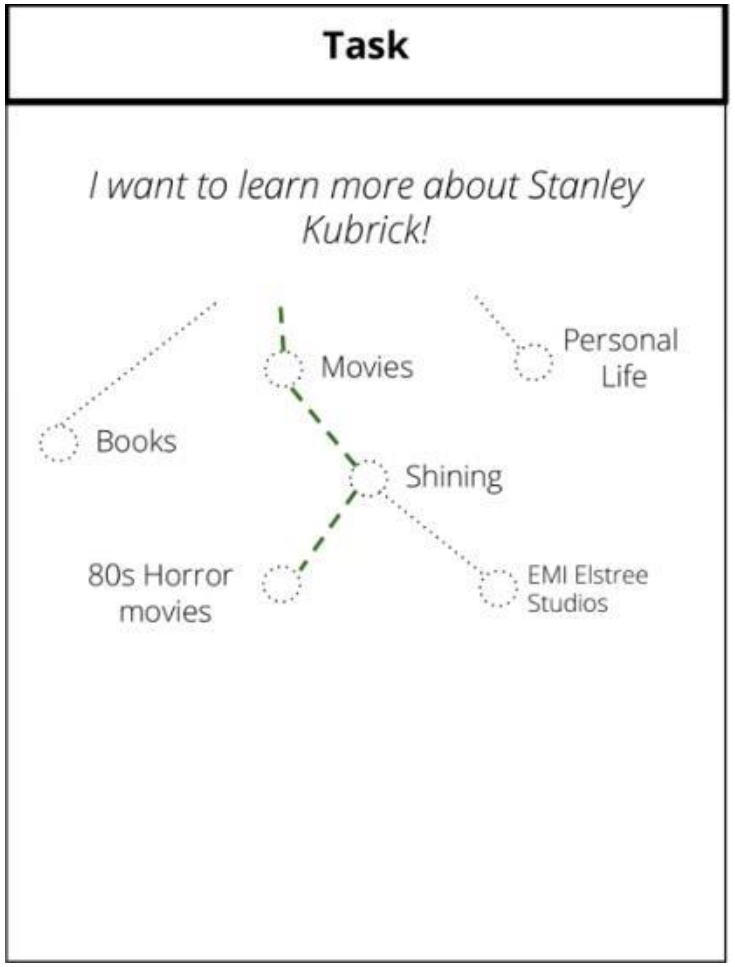
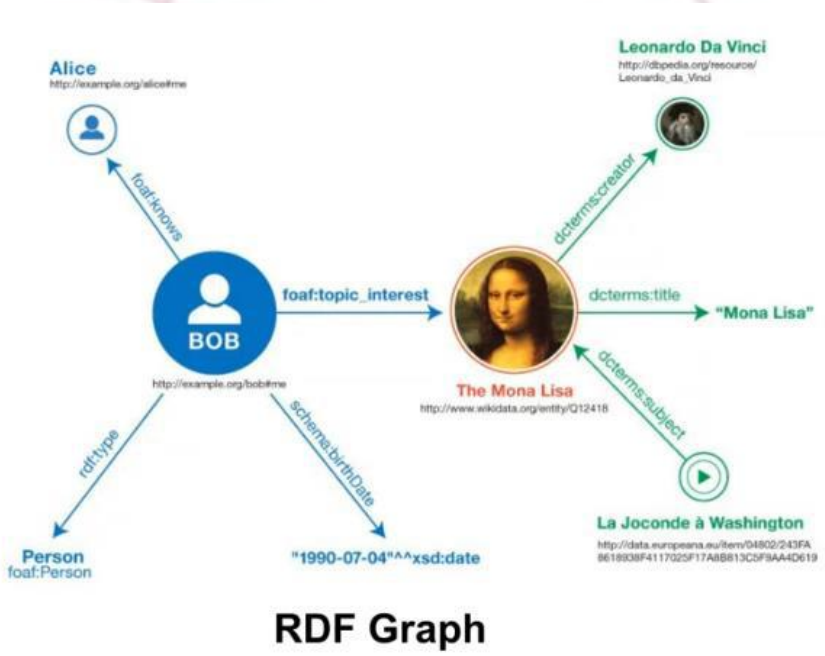
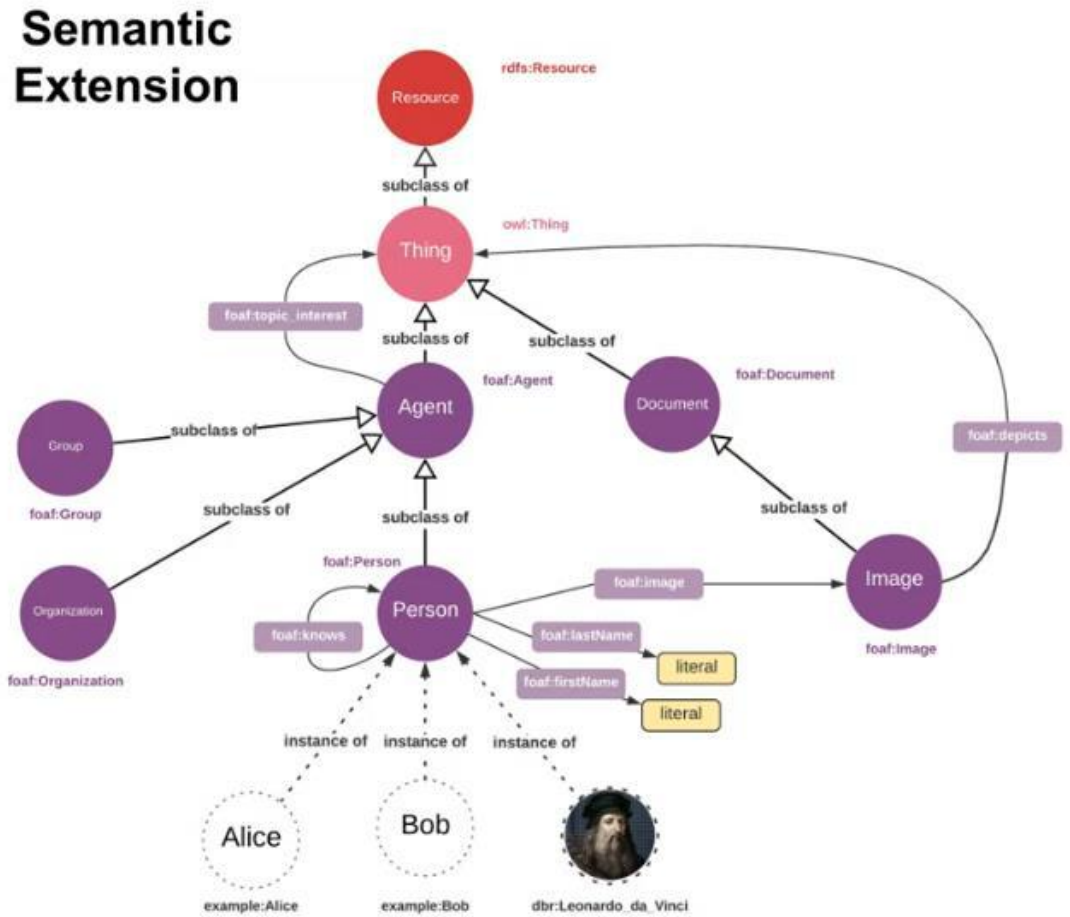
- Exploratory Search:
  - Enable information seeking tasks
  - Learning, investigating
  - Increased level of interaction with the data!

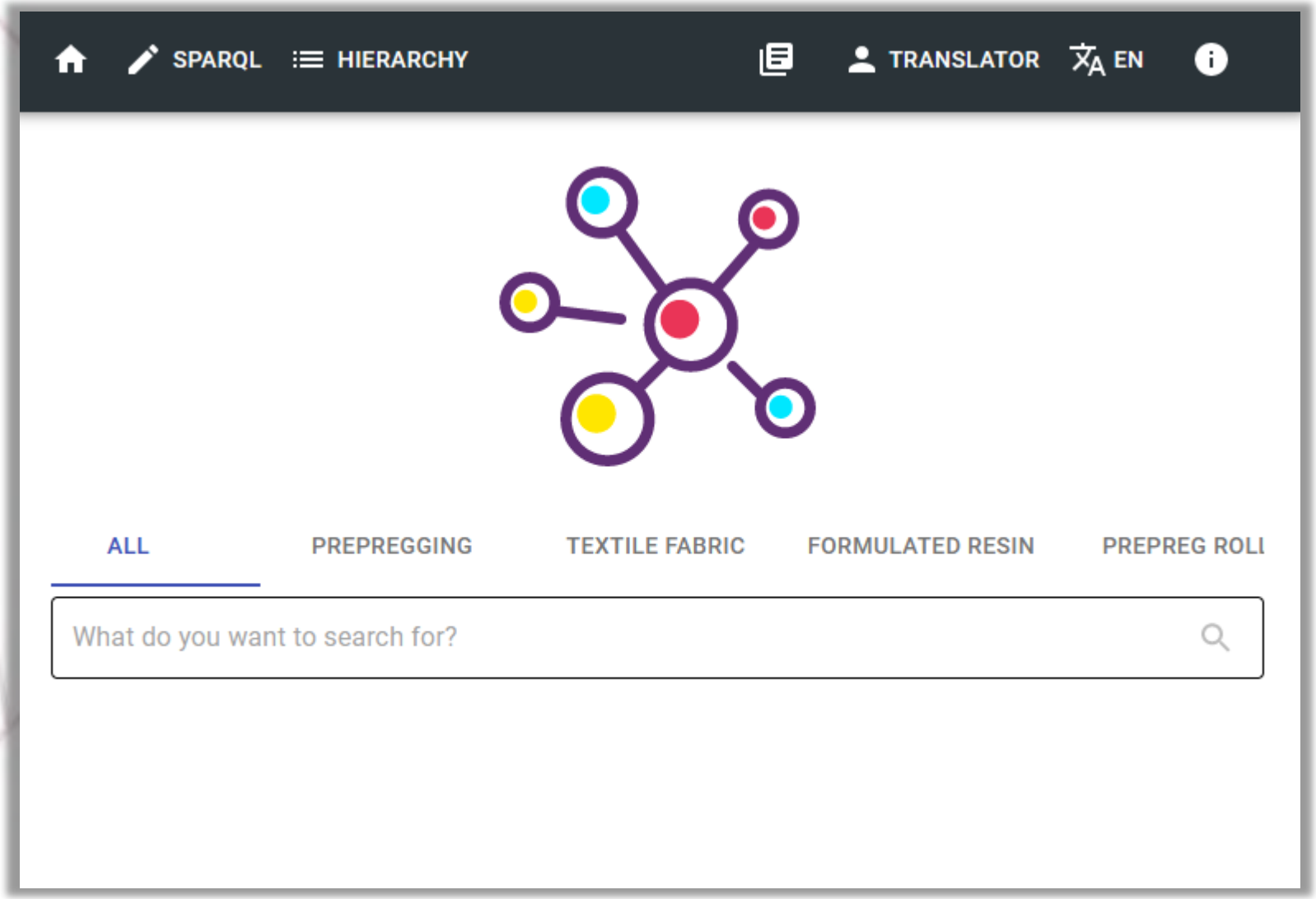


Exploratory Search on Knowledge Graphs



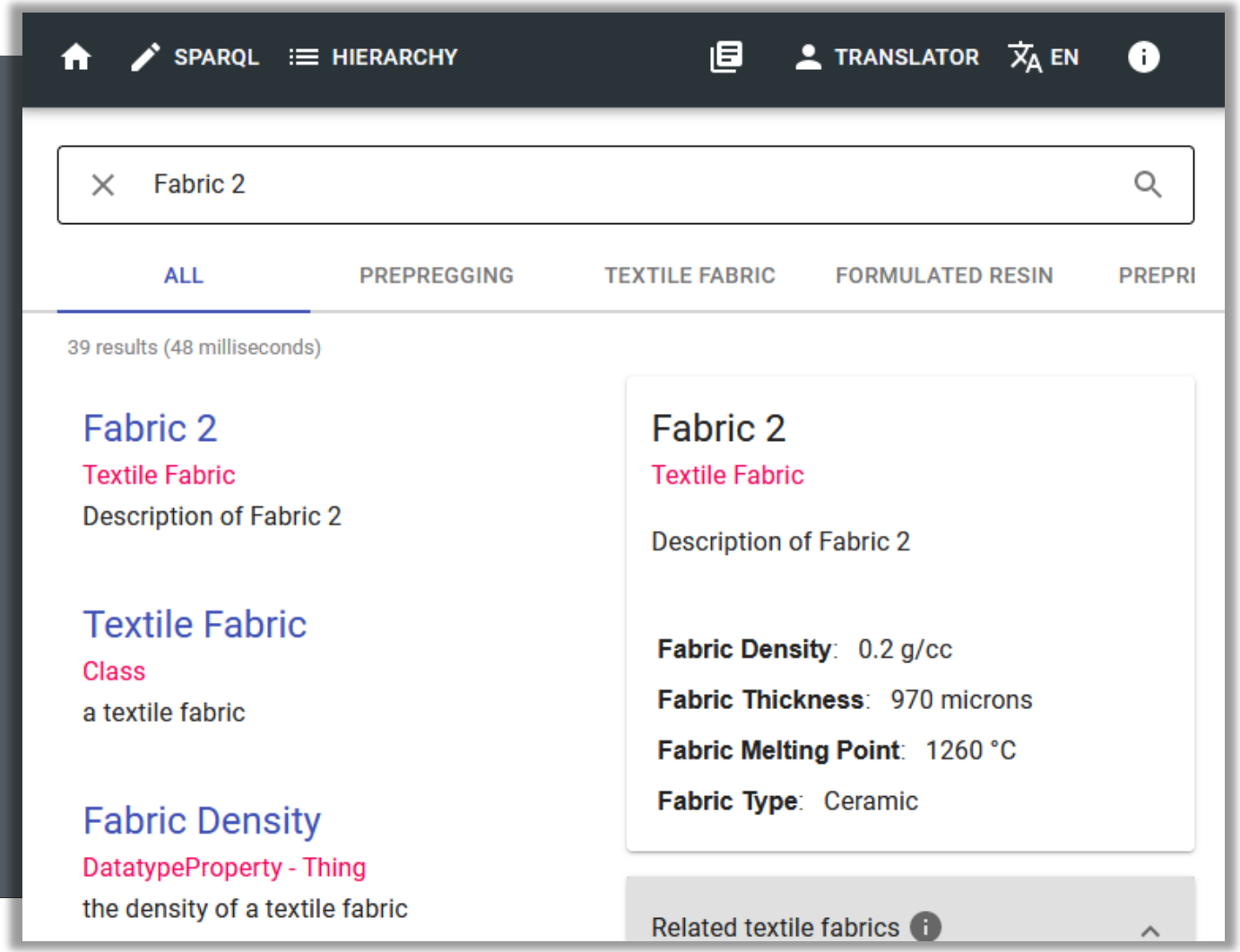


Exploratory Search System

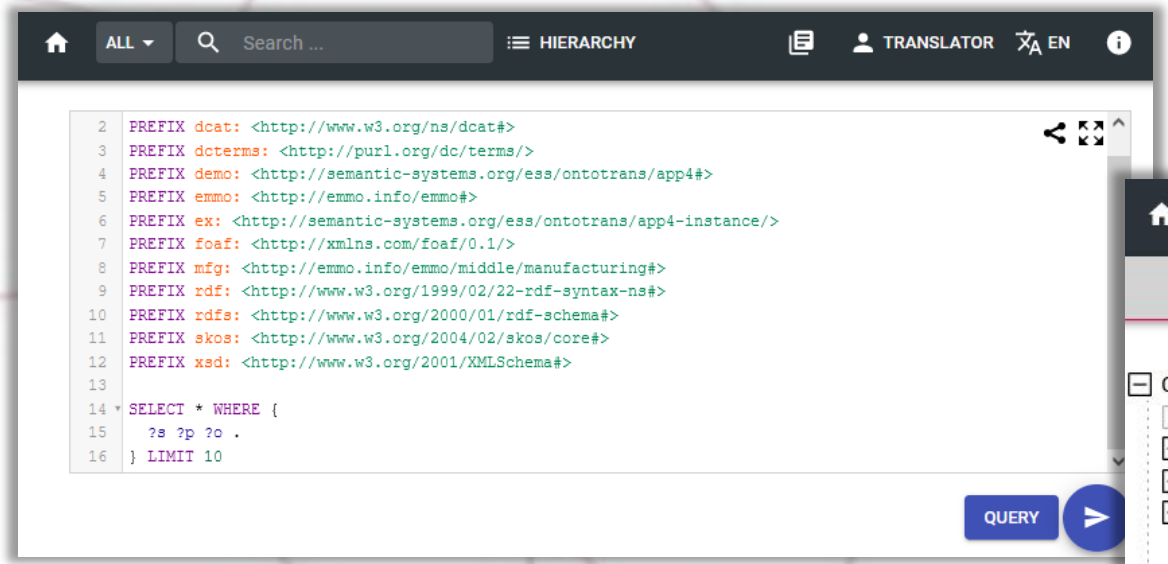


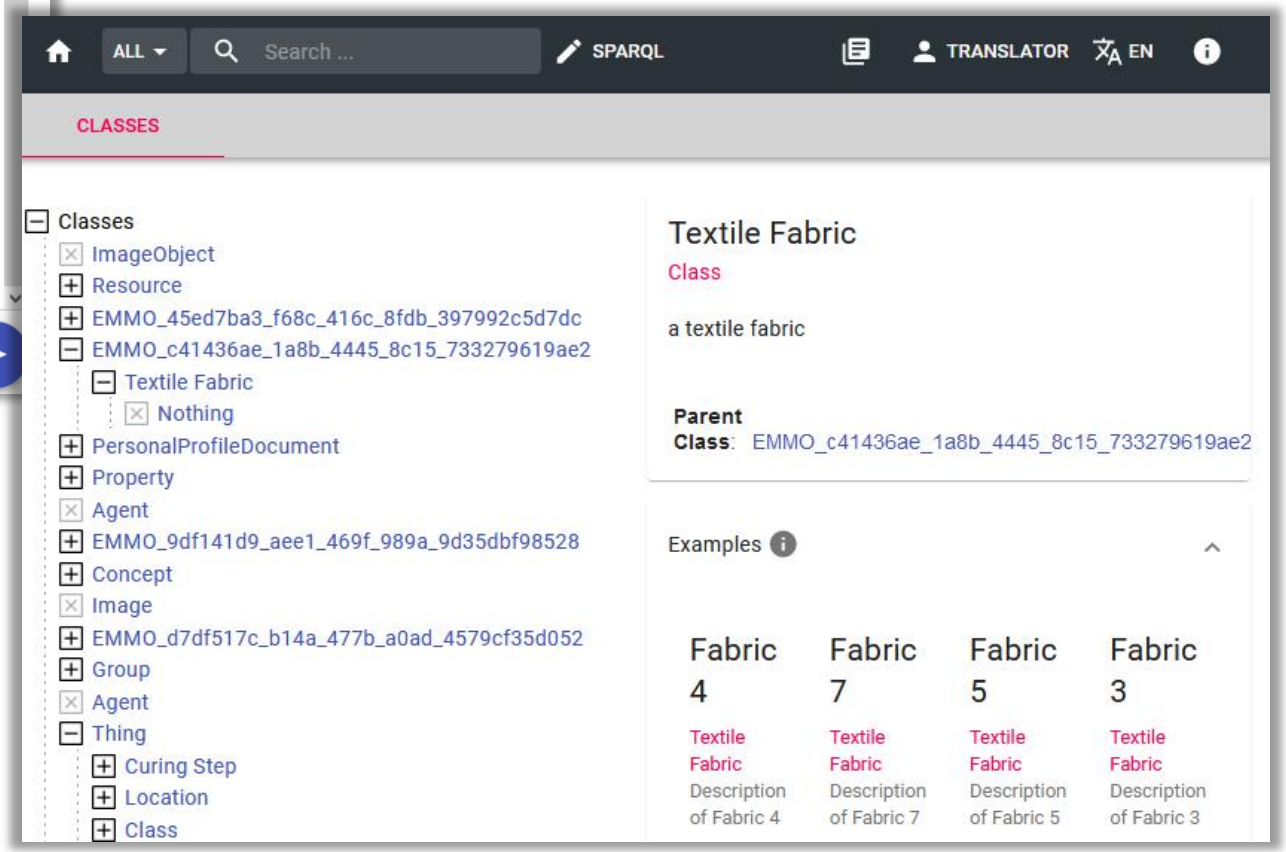
Exploratory Search System

```
5971  ###############################################################
5972  #    Classes
5973  ###############################################################
5974
5975  ###  http://semantic-systems.org/ess/ontotrans/app3#CuringStep
5976  :CuringStep
5977      rdf:type     owl:Class ;
5978      rdfs:label   "Curing Step" ;
5979      rdfs:comment "a curing step of a prepregging" .
5980
5981
5982  ###  http://semantic-systems.org/ess/ontotrans/app3#FormulatedResin
5983  :FormulatedResin
5984      rdf:type        owl:Class ;
5985      rdfs:subClassOf ce:EMMO_d7df517c_b14a_477b_a0ad_4579cf35d052 ;
5986      rdfs:label      "Formulated Resin" ;
5987      rdfs:comment    "a formulated resin" .
5988
5989
5990  ###  http://semantic-systems.org/ess/ontotrans/app3#ManufacturingMethod
5991  :ManufacturingMethod
5992      rdf:type     owl:Class ;
5993      rdfs:label   "Manufacturing Method" ;
5994      rdfs:comment "a manufacturing method" .
5995
5996
5997  ###  http://semantic-systems.org/ess/ontotrans/app3#PrepregRoll
5998  :PrepregRoll
5999      rdf:type        owl:Class ;
6000      rdfs:subClassOf ce:EMMO_45ed7ba3_f68c_416c_8fdb_397992c5d7dc ;
6001      rdfs:label      "Prepreg Roll" ;
6002      rdfs:comment    "a prepreg roll resulting from a prepregging" .
6003
6004
6005  ###  http://semantic-systems.org/ess/ontotrans/app3#Prepregging
6006  :Prepregging
6007      rdf:type        owl:Class ;
6008      rdfs:subClassOf ce:EMMO_9df141d9_aee1_469f_989a_9d35dbf98528 ;
6009      rdfs:label      "Prepregging" ;
6010      rdfs:comment    "a prepregging process" .
6011
6012
6013  ###  http://semantic-systems.org/ess/ontotrans/app3#TextileFabric
6014  :TextileFabric
6015      rdf:type        owl:Class ;
6016      rdfs:subClassOf ce:EMMO_c41436ae_1a8b_4445_8c15_733279619ae2 ;
6017      rdfs:label      "Textile Fabric" ;
6018      rdfs:comment    "a textile fabric" .
```



Exploratory Search System





Tools for Translators

- Common Graphical Framework
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- Data Analytics

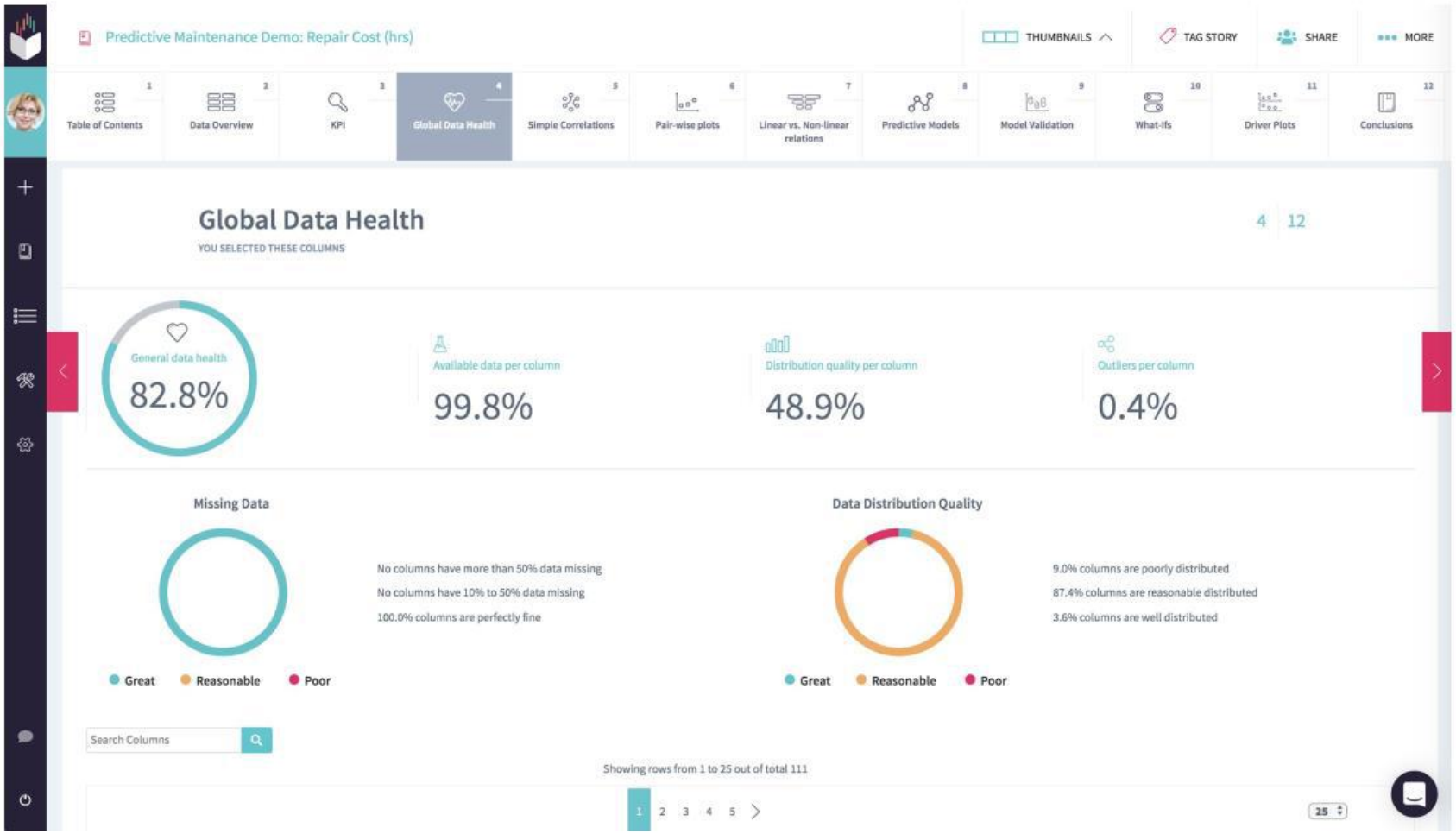
Data Analytics Tool

- **Goals:**
  - Employ qualitative and quantitative data analysis methods to extract further insights, find patterns, observe trends.
  - Provide enriched context to the Exploratory Search System
  - Adapt Data Science methods to the specific Use Cases in OntoTrans
  - Deliver prototypes and guidelines for Data Analytics

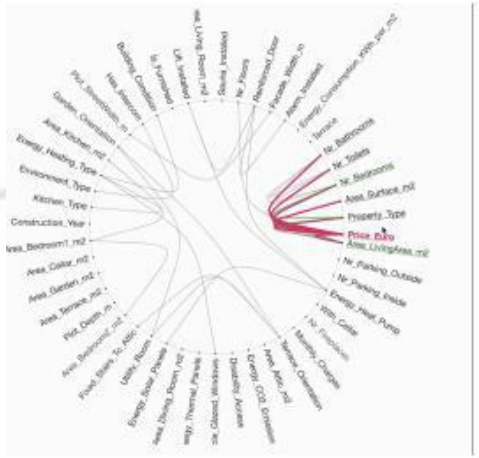
Data Analytics Tool

Data Analytics Tool

Automatic data quality analysis

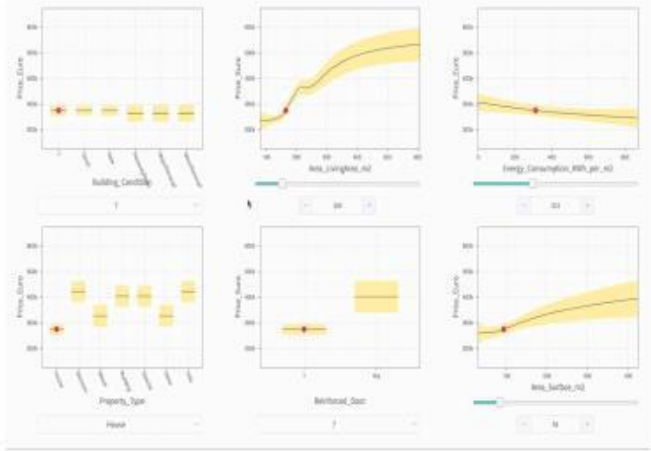


Data Analytics Tool

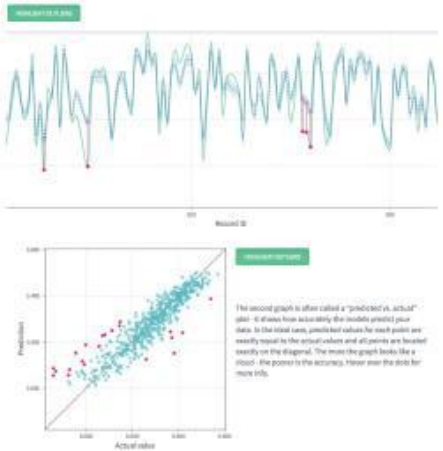


How is everything interconnected?

From all inputs, which are the dominant ones?



What should I do to get better results? What is the next best actions to get the desired result?



What are the exceptions to the rules?

- Common Graphical Framework
- Exploratory Search System (ESS)
- Data Analytics

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