



Metodologías (II)

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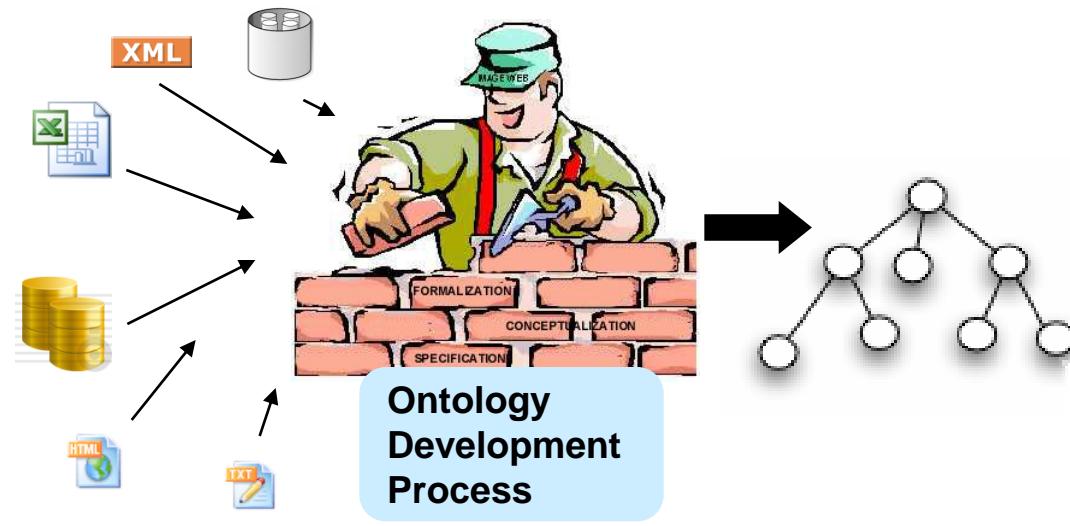
Credits to:

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Guadalupe Aguado (lupe@fi.upm.es)

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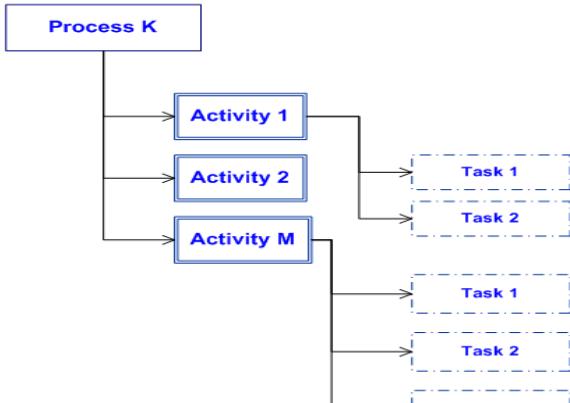
Current situation in 2010

- Reuse of knowledge-aware resources
- Ontologies are built collaboratively
- Ontologies are connected in ontology networks



Process and activities covered:

- Ontology Specification
- Scheduling
- Non-Ontological Resource Reuse
- Non-Ontological Resource Re-engineering
- Reuse General Ontologies
- Reuse Domain Ontologies
- Reuse Ontology Statements
- Reuse Ontology Design Patterns



3

All processes and activities are described with:

- A filling card
- A workflow
- Examples

Process or Activity Name	
Definition	
Goal	
Input	Output
Who	
When	

Start of ontological reuse

Users, Domain Expert and ODT

Task 1. Identify purpose, scope and level of formality

Task 2. Identify intended users

Task 3. Identify intended uses

Task 4. Identify requirements

Task 5. Group requirements

Task 6. Validate the set of requirements

Are they valid?

Task 7. Prioritize requirements

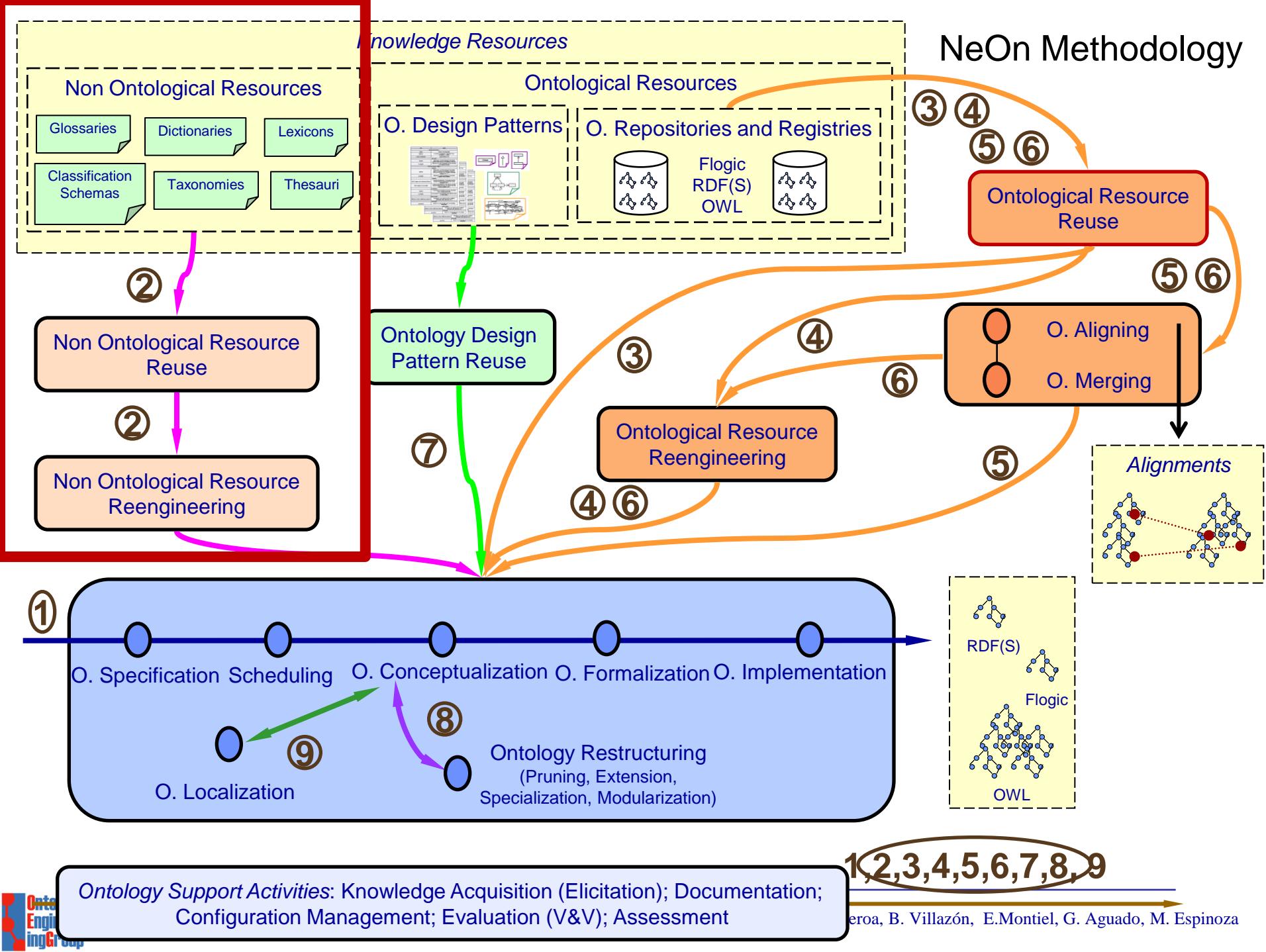
Task 8. Extract terminology and its frequency

Ontology Development Team

Output → OSRD

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NeOn Methodology



Ontology Support Activities: Knowledge Acquisition (Elicitation); Documentation; Configuration Management; Evaluation (V&V); Assessment

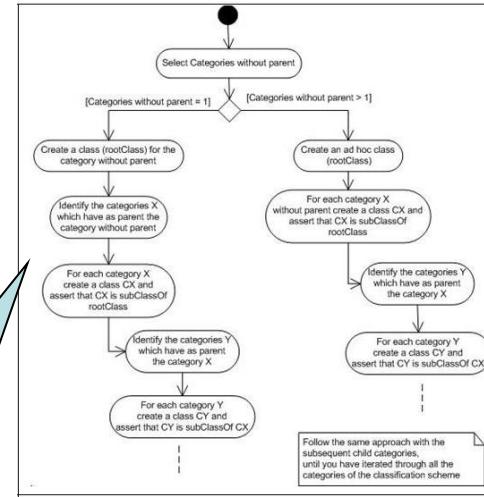
eroa, B. Villazón, E. Montiel, G. Aguado, M. Espinoza

Motivation

resource

Id	Category Name	Parent
20000	Water area	1
21000	Environmental area	20000
22000	Fishing Statistical area	20000
24020	Jurisdiction area	20000
21001	Inland/marine	21000
21002	Ocean	21000
21003	North/South/Equatorial	21000
21004	Sub Ocean	21000
21005	Large Marine ecosystem	21000

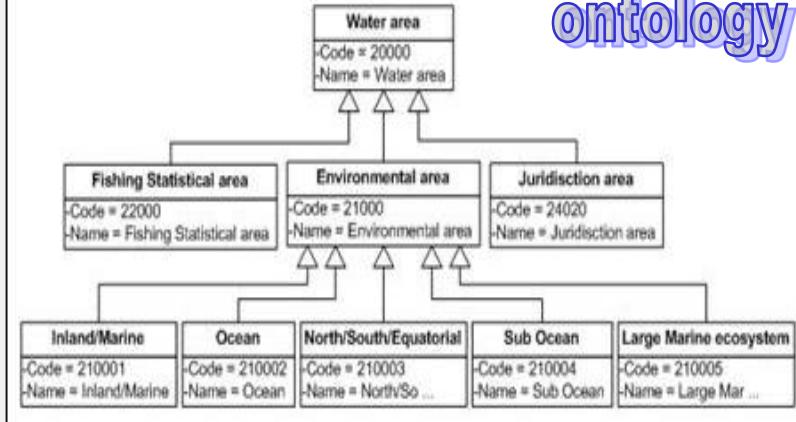
Algorithm



I want to transform my adjacency list-based classification into an ontology



(UML)
Example Solution
Ontology



ontology

Term	BT	NT	RT	UF
Rice	Cereals	Broken rice Basmati rice	Rice straw Oryza	Paddy
Oryza	Poaceae	Oryza sativa Oryza perennis Oryza rufipogon Oryza longistaminata Wetland rice Oryza glaberrima Upland rice Oryza punctata	Rice fields Cereal crops Rice	

Thesaurus

The screenshot shows the 'NOMENCLÁTOR GEOGRÁFICO' section of the 'Catalog/ID' application. It includes a header with the Spanish flag, the Government of Spain logo, and links for Archivo, Edición, Formato, Ayuda, and Dirección General del Instituto Geográfico Nacional. Below the header, there's a search bar labeled 'Catalog/ID' and a list of geographical entities categorized under 'Nación' and 'Entidades'. The entities listed include: Región geográfica, Capital de Nación, Elevación orográfica, Comunidad Autónoma, Llanura/Raso, Ciudad con Estatuto de Autonomía, Depresión orográfica, Capital de Comunidad Autónoma, Accidente costero, Provincia, Accidente marítimo, Capital de Provincia, Accidente hidrográfico, Coprincipado, Corriente fluvial, Capital de Coprincipado, Canal, Comarca, Embalse, Capital de Comarca, Lago/Laguna, Isla Humedal, Capital de Isla, Isla Fluvial, Municipio, Isla marítima, Capital de Municipio, Garganta/Hoz, E.A.T.I.M., Lugar/Paraje, Capital de E.A.T.I.M., Paso/Collado, Población, Puerto de montaña, Comunidad de Municipios, Puerto comercial, Enclave, Helipuerto comercial, Territorio anejo, Aeródromo/Aeropuerto, Territorio autonómico, Estación de Ferrocarril, and Zona neutral.

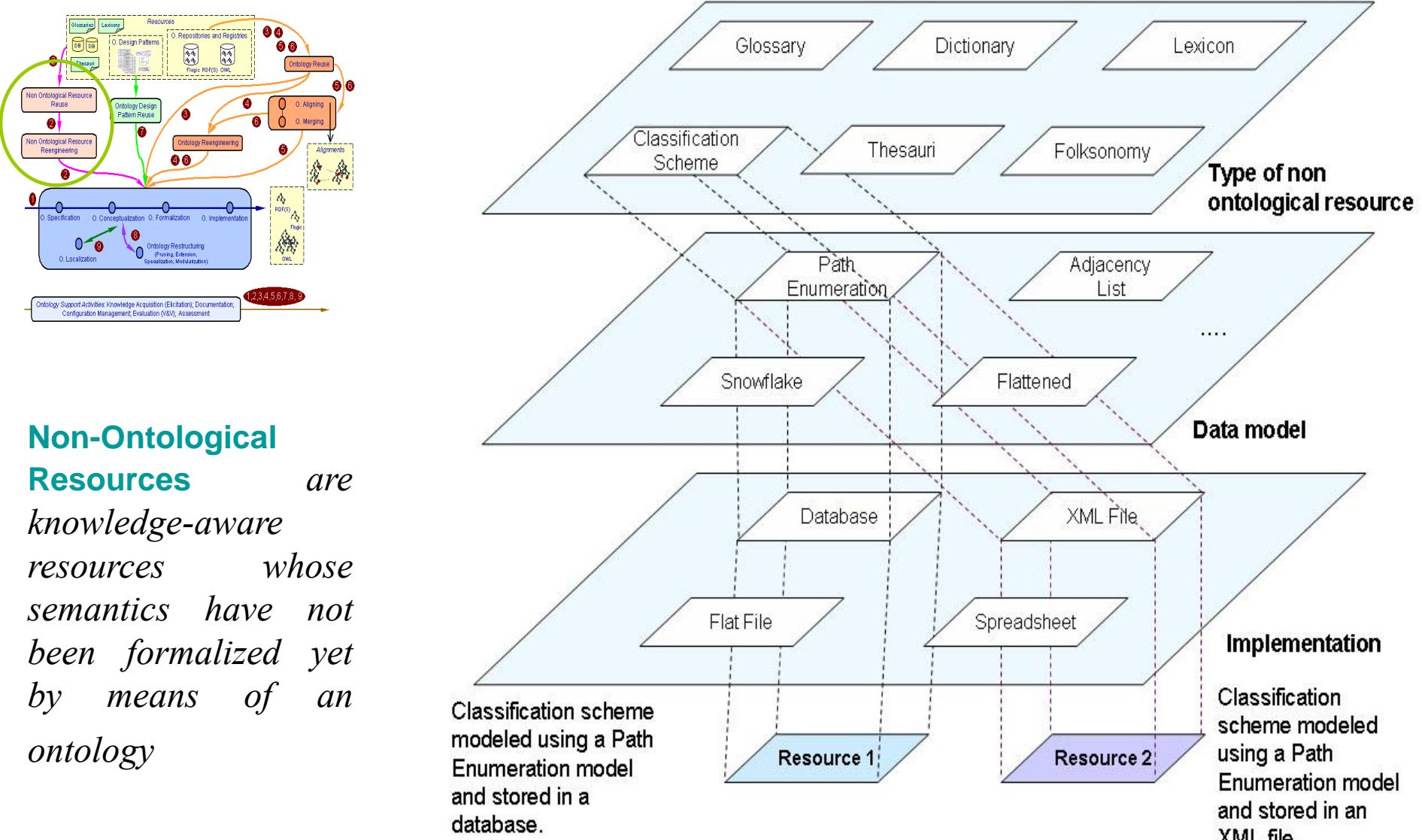
XX-YY-ZZ
02-01-02
02: transportation
01: road
02: 3-lines highway

Id	Category Name	Parent
20000	Water area	1
21000	Environmental area	20000
22000	Fishing Statistical area	20000
24020	Jurisdiction area	20000
21001	Inland/marine	21000
21002	Ocean	21000
21003	North/South/Equatorial	21000
21004	Sub Ocean	21000
21005	Large Marine ecosystem	21000

Diccionario creado por Geotools				
Diccionario de conversión DGN -> EDM.				
FORMATO:				
Tipo_dgn	Entidad	Tipo_istream	Grupo	Código_bcn cerrado Trato
NNSCCGG	NN : Nivel elemento			
	S : Estilo linea dgn			
	CCC : Color linea dgn			
	GG : Grosor linea dgn			
				código_bcn...TTGGSS
				TT : Tema
				GG : Grupo
				SS : Subgrupo
Entidad				Tipo_istream....???
104	: polilínea			
203	: célula se convierte a símbolo			
-1	: célula se explota en sus componentes			
304	: rótulo			
Grupo				
0	: sin determinar			
1	: carreteras			
2	: hidrografía			
3	: conducciones			
4	: administrativo			
				En textos el grupo corresponde a la fuente Microstation
Cerrado				
en líneas				
1	: perimetral			en textos
0	: entidad lineal abierta			n : altur
-1	: cultivo perimetral			
-2	: cultivo linea abierta			
Trato				
I: Intocable	A: Altimetría	N: No tratar	T: Textos Asociados	
S: Textos sueltos	C: Cultivo	F: Solo salida	!: Tratar norma	
				TTGGSS
02000900	104	1	0	090101 1 !I Marco de hoja
02300902	104	2	0	100200 0 !I Base Geodésica de Ma
06005900	104	3	0	025102 0 !I Acantilado
06006900	104	4	0	025302 0 !I Costa rocosa no acar
06009900	104	5	2	037402 1 !I Playa Fluvial de gui
06012900	104	6	0	025501 1 !I Lavas. Contorno
06015900	104	7	0	058303 0 !I Dique de hormigón >
06018900	104	8	0	058304 0 !I Dique de hormigón <
07013400	104	9	0	058302 0 !I Dique de tierra
07016400	104	10	0	055401 1 !I Vertedero. Contorno
11003003	104	11	1	062202 0 !I Autopista. Enlace
11012000	104	12	0	056091 1 !I Patio. Contorno
13003300	104	13	1	060101 0 !I Autopista. Eje
13303300	104	14	1	060131 0 !I Autopista en Contruc
14002401	104	15	1	066901 1 !I Puesto de s.o.s.
14003301	104	16	1	067901 1 !I Peaje
15003003	104	17	1	062204 0 !I Autovía. Enlace
15003004	104	18	1	060701 0 !I Autovía

Implicit knowledge coded in numbers

Types of non-ontological resources

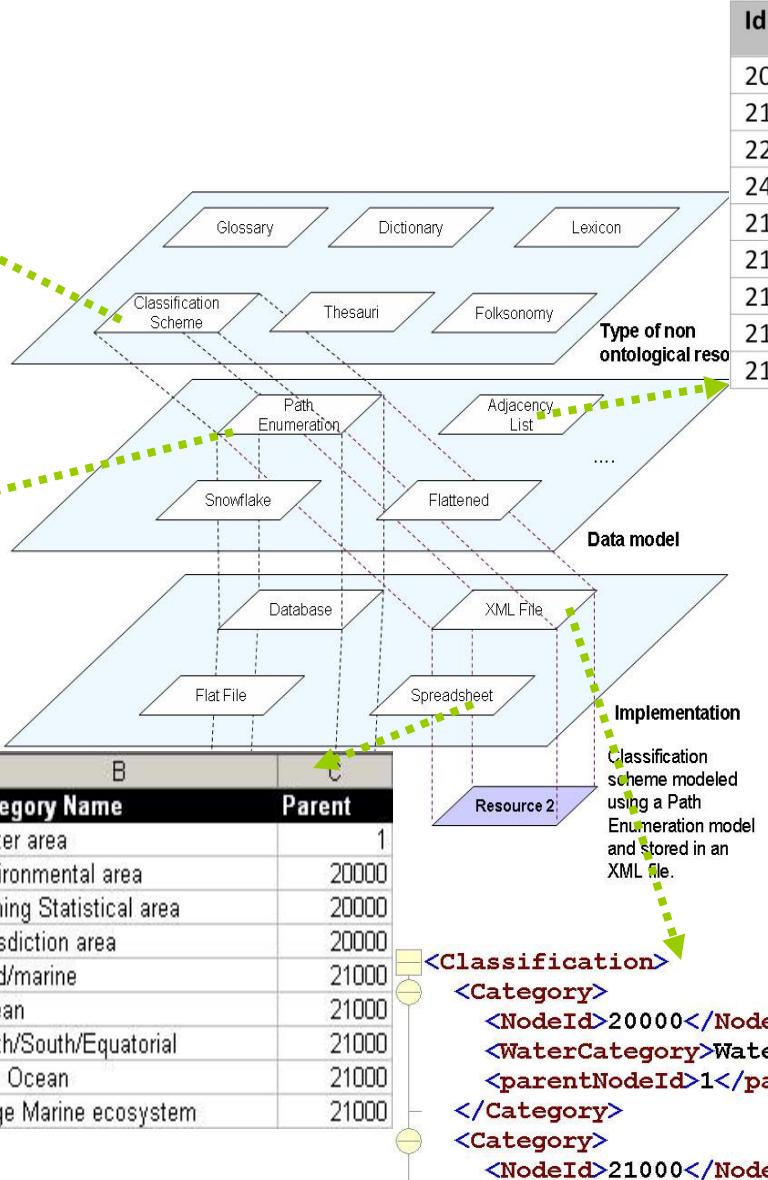


Types of non-ontological resources

<input checked="" type="radio"/>	Water area
<input type="checkbox"/>	Environmental area
<input type="checkbox"/>	Inland/marine
<input type="checkbox"/>	Ocean
<input type="checkbox"/>	North/South/Equatorial
<input type="checkbox"/>	Sub-Ocean
<input type="checkbox"/>	Large Marine Ecosystem
<input type="checkbox"/>	Fishing Statistical area
<input type="checkbox"/>	Jurisdiction area
<input type="checkbox"/>	Fishery Management area
<input type="checkbox"/>	Reporting area

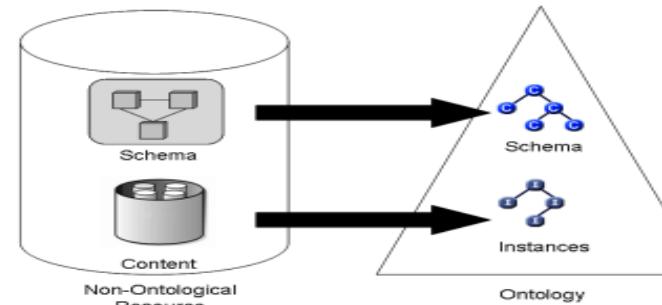
Id	Category Name
20000	Water area
20000.21000	Environmental area
20000.22000	Fishing Statistical area
20000.24020	Jurisdiction area
21000.21001	Inland/marine
21000.21002	Ocean
21000.21003	North/South/Equatorial
21000.21004	Sub Ocean
21000.21005	Large Marine ecosystem

A	B	C
Id	Category Name	Parent
1	Water area	1
2	20000 Environmental area	20000
3	21000 Fishing Statistical area	20000
4	22000 Jurisdiction area	20000
5	21001 Inland/marine	21000
6	21002 Ocean	21000
7	21003 North/South/Equatorial	21000
8	21004 Sub Ocean	21000
9	21005 Large Marine ecosystem	21000
10		



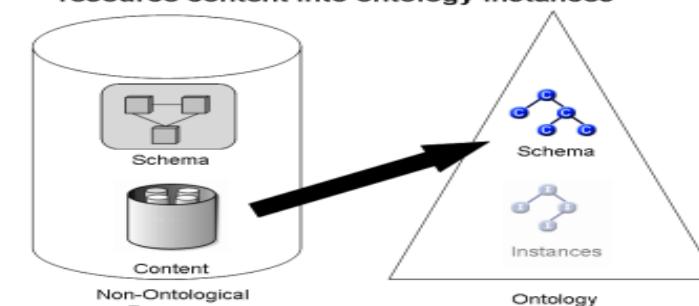
Approaches to transform resources into ontologies

ABox



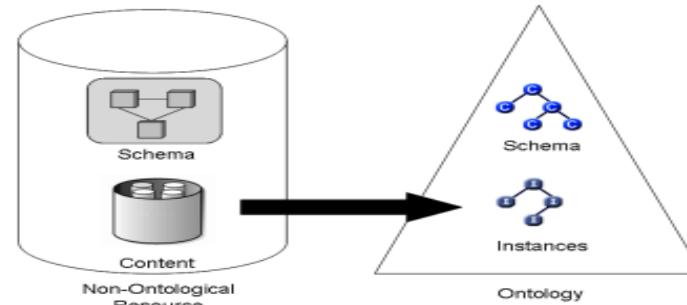
Transforming resource schema into an ontology schema, and resource content into ontology instances

TBox



Transforming resource content into an ontology schema

Population



Transforming resource content into instances of an existing ontology

From Knowledge resources to Ontologies

- Making explicit the semantic of the relations between concepts

```
<TERM>
<DESCRIPTOR>water</DESCRIPTOR>
<RT>distilled water</RT>
<RT>tear</RT>
</TERM>
```

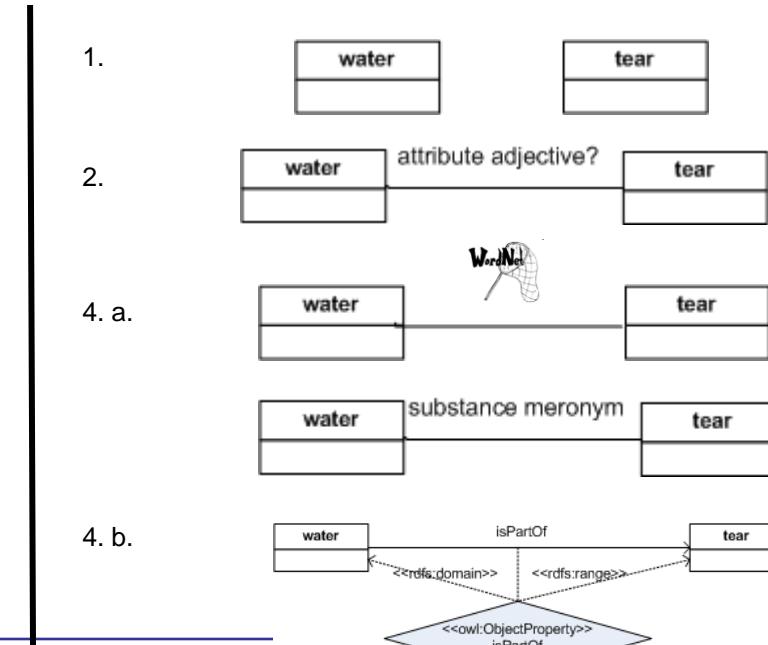
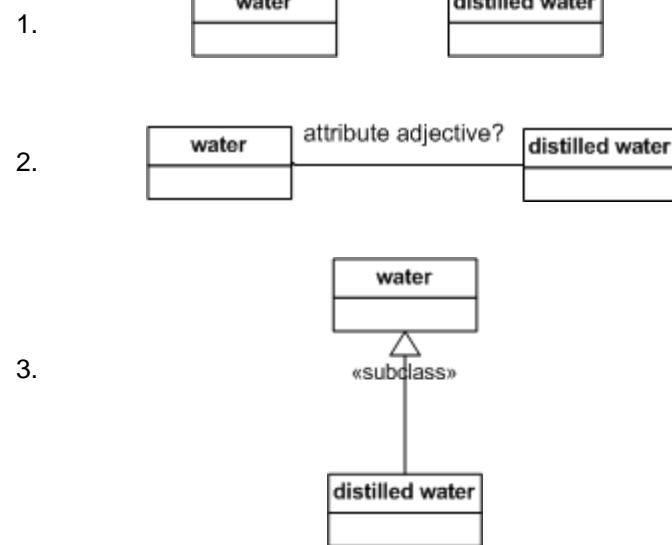
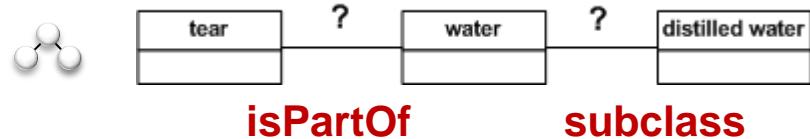
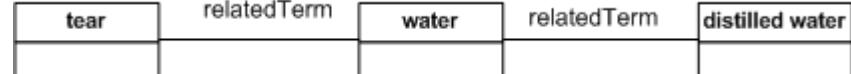


ID	Name	
10	Vehicle	?
10.01	Car	
10.02	Motorcycle	
10.03	Bicycle	
10.01	Vehicle	?
10.01.01	Wheel	
10.01.02	Seat	
10.01.03	Door	

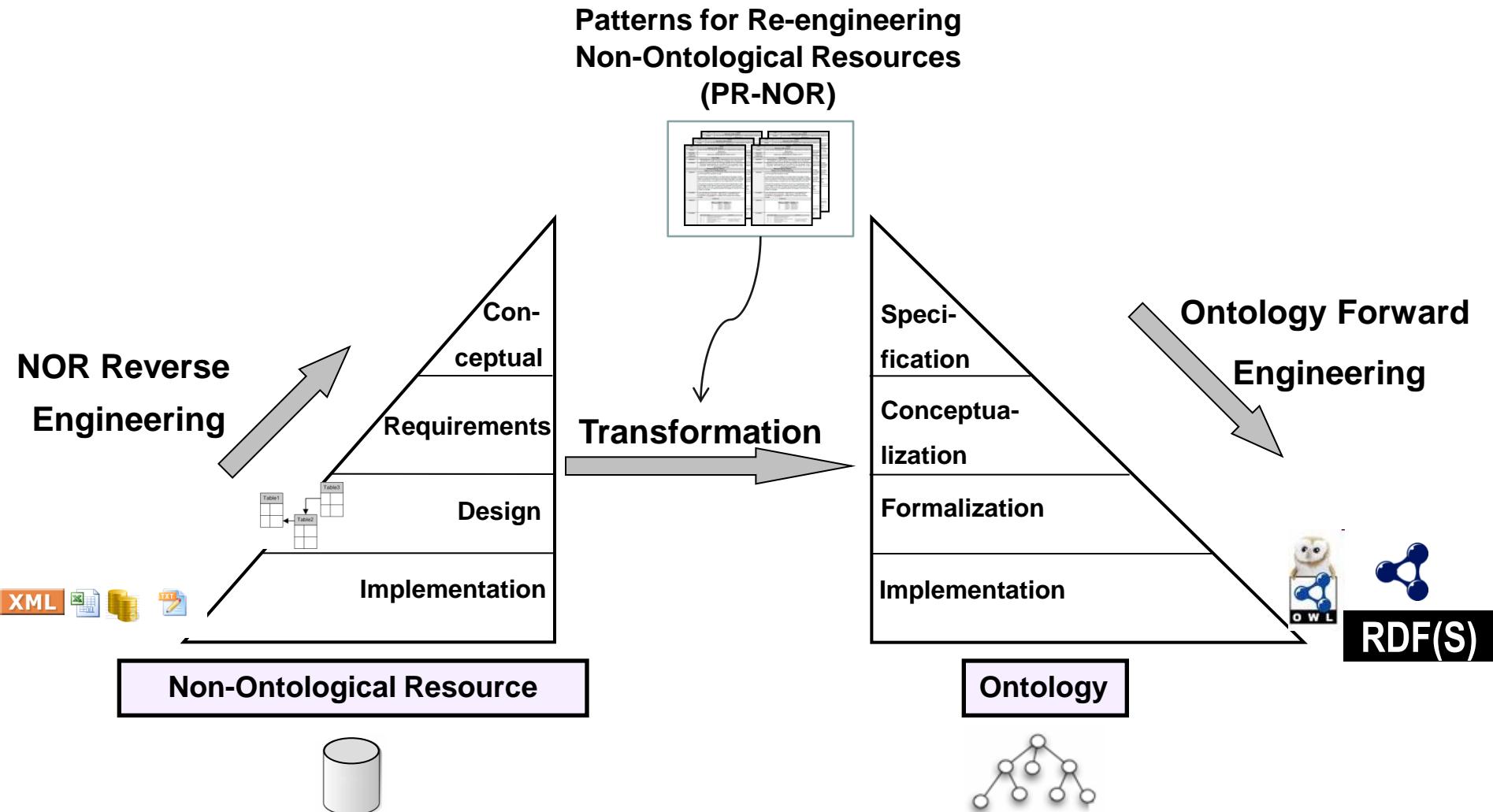
Semantics of the Relations among the entities

- TBox transformation: patterns must disambiguate the semantics of the relations among the NOR entities.

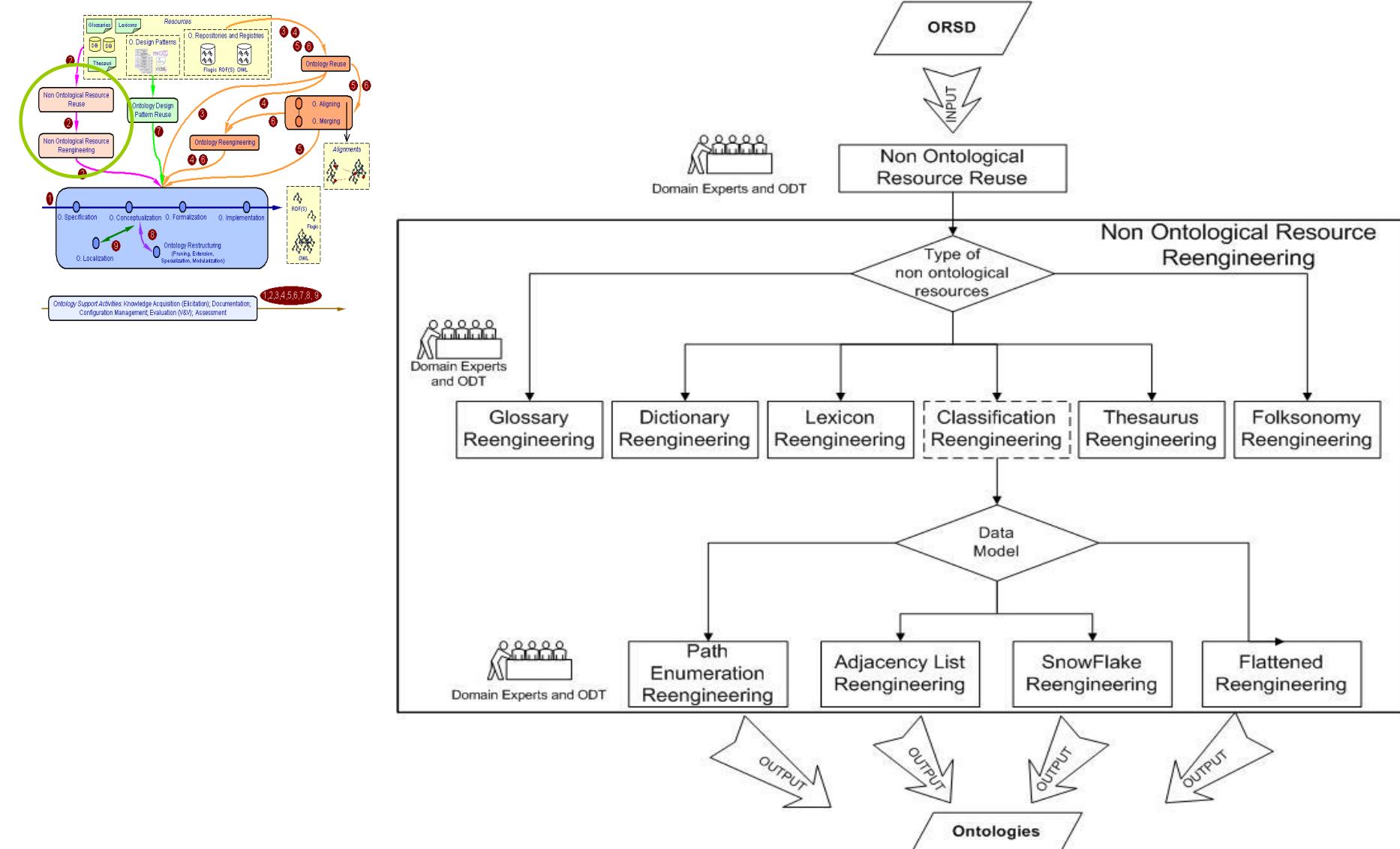
```
<TERM>
<DESCRIPTOR>water</DESCRIPTOR>
<RT>distilled water</RT>
<RT>tear</RT>
</TERM>
```



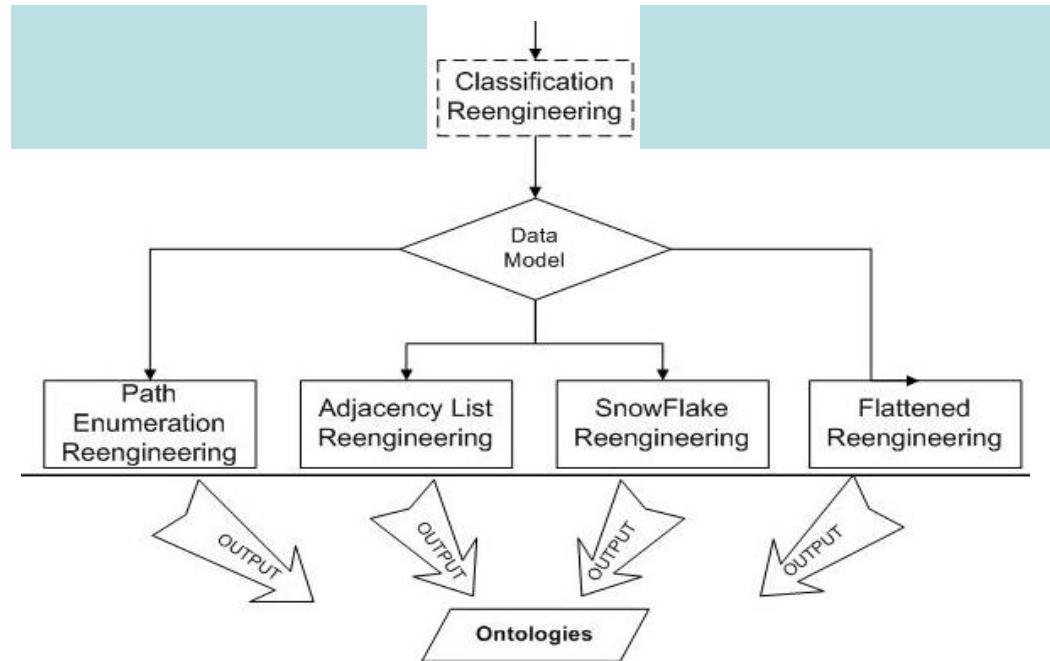
Re-engineering Model for NORs



Reuse and Re-engineering Non-ontological Resources



A pattern for each resource data model



Classification to Taxonomy (Adjacency List)

	Value
Name	Name of the organization
Member	An external committee of shareholders that represents the interests of the organization
General	Description of the general principles addressed by the organization
Example	Description of the general principles addressed by the organization
Policies for Recognizing Non-Domestic Resources	Policies for recognizing non-domestic resources
General	Describe a value-adding role of the non-domestic resource
Example	Describe a value-adding role of the non-domestic resource
Strategic Plan	Strategic Plan
General	Description of the strategic plan adopted after applying the policy for recognizing the non-domestic resource
Design Change	Design Change
General	Description of the design changes adopted after applying the policy for recognizing the non-domestic resource
UML	Unified Modeling Language
General	General description of the UML diagrams used for the non-domestic resource design
UML Profile	UML Profile
General	Excludes a graphical representation of the design changes for the non-domestic resource
Demand	Description of requirements of the non-domestic resources, using a relevant standard
Example	Description of relevant aspects of the requirements of the non-domestic resources
Relationships	Relationships
General	Description of relevant concepts, mechanisms or techniques used for the non-domestic resource relationships
Design Change	Design Change
General	Description of relevant concepts, mechanisms or techniques used for the non-domestic resource design changes

Classification to Taxonomy (Path Enumeration Model)

Classification to Taxonomy (Flattened Model)

Role	Description	Value
Name	Description of the participant	
Member	An active member of a research-based temporary number	
Guest	A person who has been invited to participate in the research	
Non-member	A person who is not a member of the research group	
Employee	Description of individual who is employed by the researcher	
Participant	Description of the participant in the research being conducted	
Pattern for Reporting New Ontological Resources		
General	Description of language of the ontological resource	
Example	Description of language of one of the ontological resources	
General	Description of the ontological resource	
Example	Description of one of the ontological resources	
General	Description of the ontological design	
Example	Description of one of the ontological designs after applying the design for specifying the ontological resources	
(None)	General	Specified neither the name of the code nor the code for ontological description being used
(None)	Example	Provides enough a general description of the ontology for human interpretation
General	Description of language of the ontological resources being used	
Example	Description of one of the languages of the ontological resources being used	
Pattern for Reporting Ontological Modifications in the Study Object		
Participants	Description of the participants in the study object	
Involved components	Description of the components involved in the study object	
General	Description of language of the ontological modifications to the learning process	

Classification to Taxonomy (Snowflake Model)



Template for the PR-NOR

Slot	Value
General Information	
Name	Name of the pattern
Identifier	An acronym composed of component type + abbreviated name of the component + number
Component Type	Pattern for Re-engineering Non-Ontological Resource (PR-NOR)
Use Case	
General	Description in natural language of the re-engineering problem addressed by the pattern for re-engineering non-ontological resources.
Example	Description in natural language of an example of the re-engineering problem.
Pattern for Re-engineering Non-Ontological Resource	
INPUT: Resource to be Re-engineered	
General	Description in natural language of the non-ontological resource.
Example	Description in natural language of an example of the non-ontological resource.
Graphical Representation	
General	Graphical representation of the non-ontological resource.
Example	Graphical representation of the example of non-ontological resource.
OUTPUT: Designed Ontology	
General	Description in natural language of the ontology created after applying the pattern for re-engineering the non-ontological resource.
Graphical Representation	
(UML) General Solution Ontology	Graphical representation, using the UML profile (Brockmans & Haase, 2006), of the ontology created for the non-ontological resource being re-engineered.
(UML) Example Solution Ontology	Example showing a graphical representation, using the UML profile (Brockmans & Haase, 2006), of the ontology created for the non-ontological resource being used.
PROCESS: How to Re-engineer	
General	Description in natural language of the general re-engineering process, using a sequence of activities.
Example	Description in natural language of the re-engineering process applied to the non-ontological resource example, using the above sequence of activities.
Formal Transformation	
General	Formal description of the transformation by using the formal definitions of the resources.
Relationships (Optional)	
Relations to other modelling components	Description of any relation to other PR-NOR patterns or other ontology design patterns.

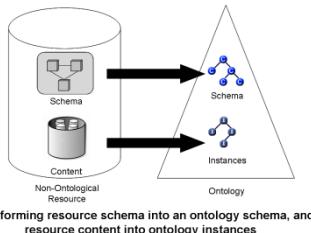
INPUT

OUTPUT

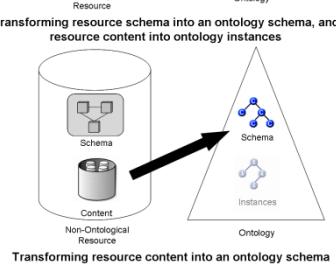
PROCESS

Patterns for Re-engineering Classification Schemes into Ontologies

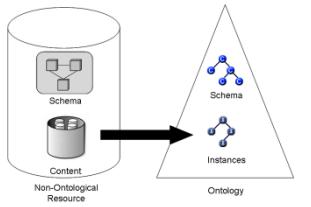
N	Identifier	Type of NOR	NOR Data Model	Transformation approach	Target
1	PR-NOR-CLTX-01	Classification Scheme	Path Enumeration	TBox	Ontology Schema
2	PR-NOR-CLTX-02	Classification Scheme	Adjacency List	TBox	Ontology Schema
3	PR-NOR-CLTX-03	Classification Scheme	Snowflake	TBox	Ontology Schema
4	PR-NOR-CLTX-04	Classification Scheme	Flattened	TBox	Ontology Schema
5	PR-NOR-CLLO-10	Classification Scheme	Path Enumeration	ABox	Ontology
6	PR-NOR-CLLO-11	Classification Scheme	Adjacency List	ABox	Ontology
7	PR-NOR-CLLO-12	Classification Scheme	Snowflake	ABox	Ontology
8	PR-NOR-CLLO-13	Classification Scheme	Flattened	ABox	Ontology



– ABox transformation



– TBox transformation



Pattern for re-engineering a classification scheme, which follows the adjacency list data model, into an ontology schema

INPUT: Non-Ontological Resource General

A non-ontological resource holds a classification scheme which follows the adjacency list model. A classification scheme is a rooted tree of concepts, in which each concept groups entities by some particular degree of similarity. The semantics of the hierarchical relation between parents and children concepts may vary depending of the context. The adjacency list data model for hierarchical classifications proposes to create an entity which holds a list of items with a linking column associated to their parent items.

Category Code	Category Name	Parent Category Code
1	Category1	Null
2	Category2	Null
3	Category3	1
4	Category4	1
5	Category6	3
6	Category7	4
...

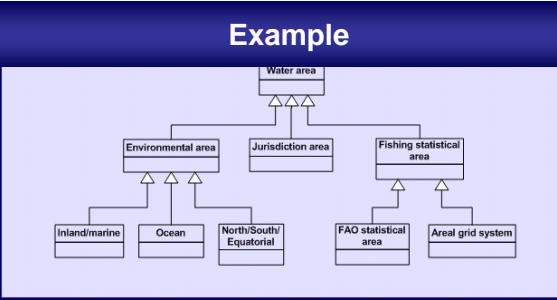
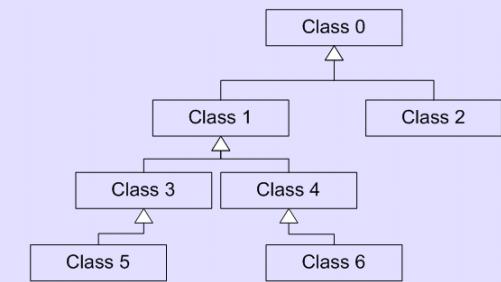
Example

The FAO classification for water areas groups them according to some different criteria as environment, statistics, and jurisdiction, among others. This classification scheme is available at <http://www.fao.org/figis/servlet/RefServlet>

ID	CSI_Name	Parent
20000	Water area	
21000	Environmental area	20000
24020	Jurisdiction area	20000
22000	Fishing Statistical area	20000
21001	Inland/marine	21000
21002	Ocean	21000
21003	North/South/Equatorial	21000
22001	FAO statistical area	22000
22002	Areal grid system	22000

OUTPUT: Ontology General

The ontology generated will be based on the taxonomy architectural pattern (AP-TX-01). Each category in the classification scheme is mapped to a class, and the semantics of the relationship between children and parent are disambiguated by using an external resource.



PROCESS: How to Re-engineer

2. Create the Environmental area class.
3. Using the external resource identify the semantics of the relation between the Environmental area class and the Water area class, and set up the relation identified.
 - 3.1. Create the Inland/marine class.
 - 3.2. Using the external resource identify the semantics of the relation between the Inland/marine class and the Environmental area class, and set up the identified relation.
 - 3.3. Create the Ocean class.
 - 3.4. Using the external resource identify the semantics of the relation between the Ocean class and the Environmental area class, and set up the relation identified.
 - 3.5. Create the North/South/Equatorial class.
 - 3.6. Using the external resource identify the semantics of the relation between the North/South/Equatorial class and the Environmental area class, and set up the relation identified.
4. Create the Fishing Statistical area class.
5. Using the external resource identify the semantics of the relation between the Fishing Statistical area class and the Water area class, and set up the relation identified.
 - 5.1. Create the FAO statistical area class.
 - 5.2. Using the external resource identify the semantics of the relation between the FAO statistical area class and the Fishing Statistical area class, and set up the relation identified.
 - 5.3. Create the Areal grid system class.
 - 5.4. Using the external resource identify the semantics of the relation between the Areal grid system class and the Fishing Statistical area class, and set up the relation identified.
6. Create the Jurisdiction area class.
7. Using the external resource identify the semantics of the relation between the Jurisdiction area class and the Water area class, and set up the relation identified.



PR-NOR library at the ODP Portal

submissions:reengineeringodps discussion view source history

Submissions:ReengineeringODPs

Below you find the currently proposed Re-engineering OPs (RPs).
New proposals of RPs are very welcome. Please [post a new proposal](#) if you want to contribute.

Proposed Re-engineering ODPS

Pattern for re-eng scheme, which follows the recordbased data model, into an ontology schema
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Pattern for re-eng scheme, which follows the recordbased data model, into an ontology schema
Pattern for re-eng scheme, which follows the recordbased data model, into an ontology schema
Term-based – record-based thesaurus to light

submissions:pattern for re-engineering a term-based thesaurus, which follows the recordbased data model, into an ontology schema discussion view form history

Submissions:Pattern for re-engineering a term-based thesaurus, which follows the recordbased data model, into an ontology schema

If you are a member of [quality committee](#) please visit the [evaluation section](#).

If you are author of this proposal or you want to contribute to this pattern's review, you can:

- ask for a review [post your open review](#)
- specify if this revision takes in account any of the review(s) [Add a new scenario for Pattern for re-engineering a term-based thesaurus, which follows the recordbased data model, into an ontology schema](#)

In general, it could be useful to visit the [evaluation section](#) to have informations about the evaluation process of this proposal

Current revision ID: 8956

General information

Name Pattern for re-engineering a term-based thesaurus, which follows the recordbased data model, into an ontology schema
Problem Re-engineering a term-based thesaurus which follows the record-based model to design an ontology schema.

Non-Ontological Resource

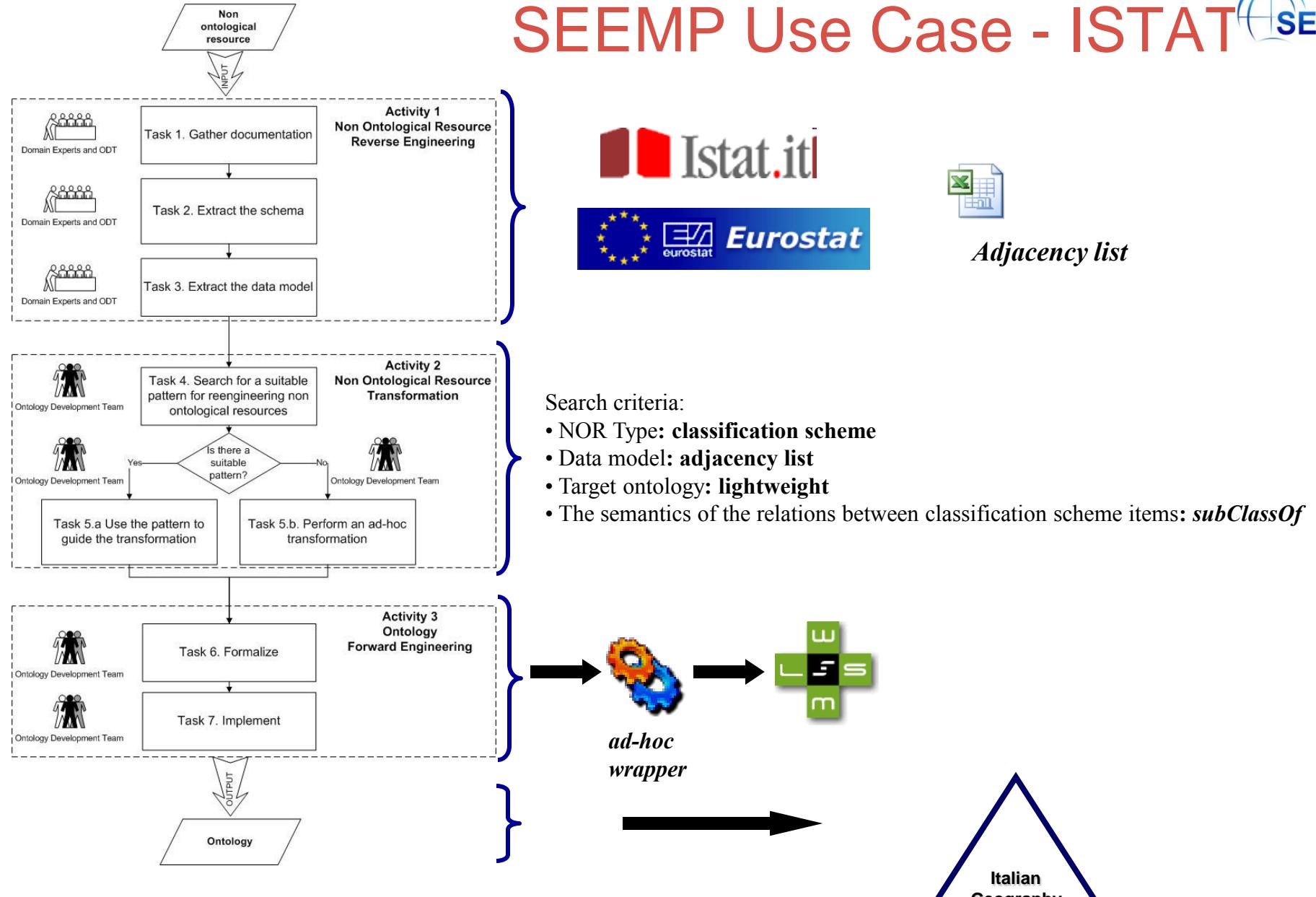
Description A non-ontological resource holds a term-based thesaurus which follows the record-based model.
A thesaurus represents the knowledge of a domain with a collection of terms and a limited set of relations between them. The record-based data model is a denormalized structure, uses a record for every term with the information about the term, such as synonyms, broader, narrower and

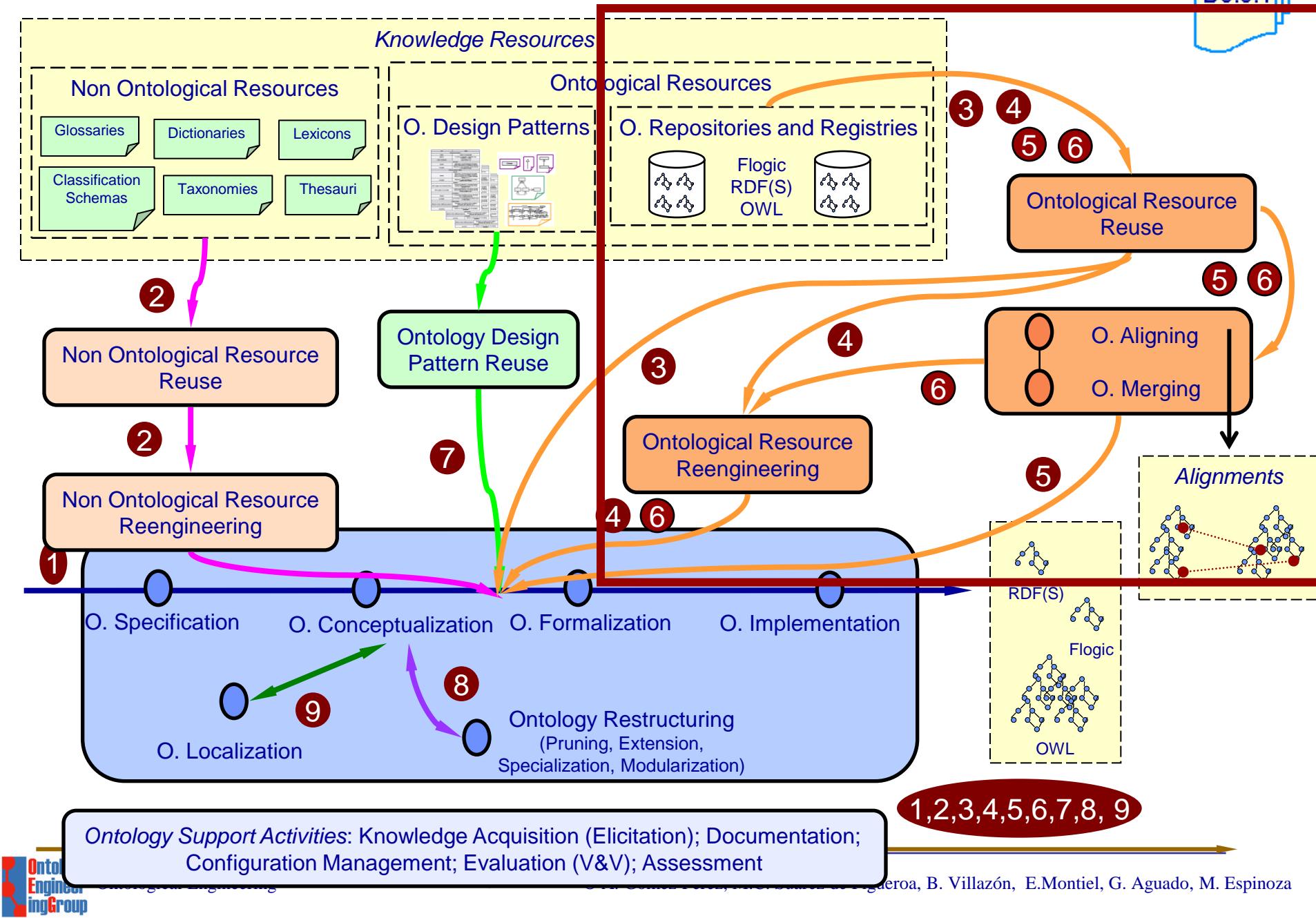
<http://ontologydesignpatterns.org/wiki/Submissions:ReengineeringODPs>

SEEMP Use Case - ISTAT

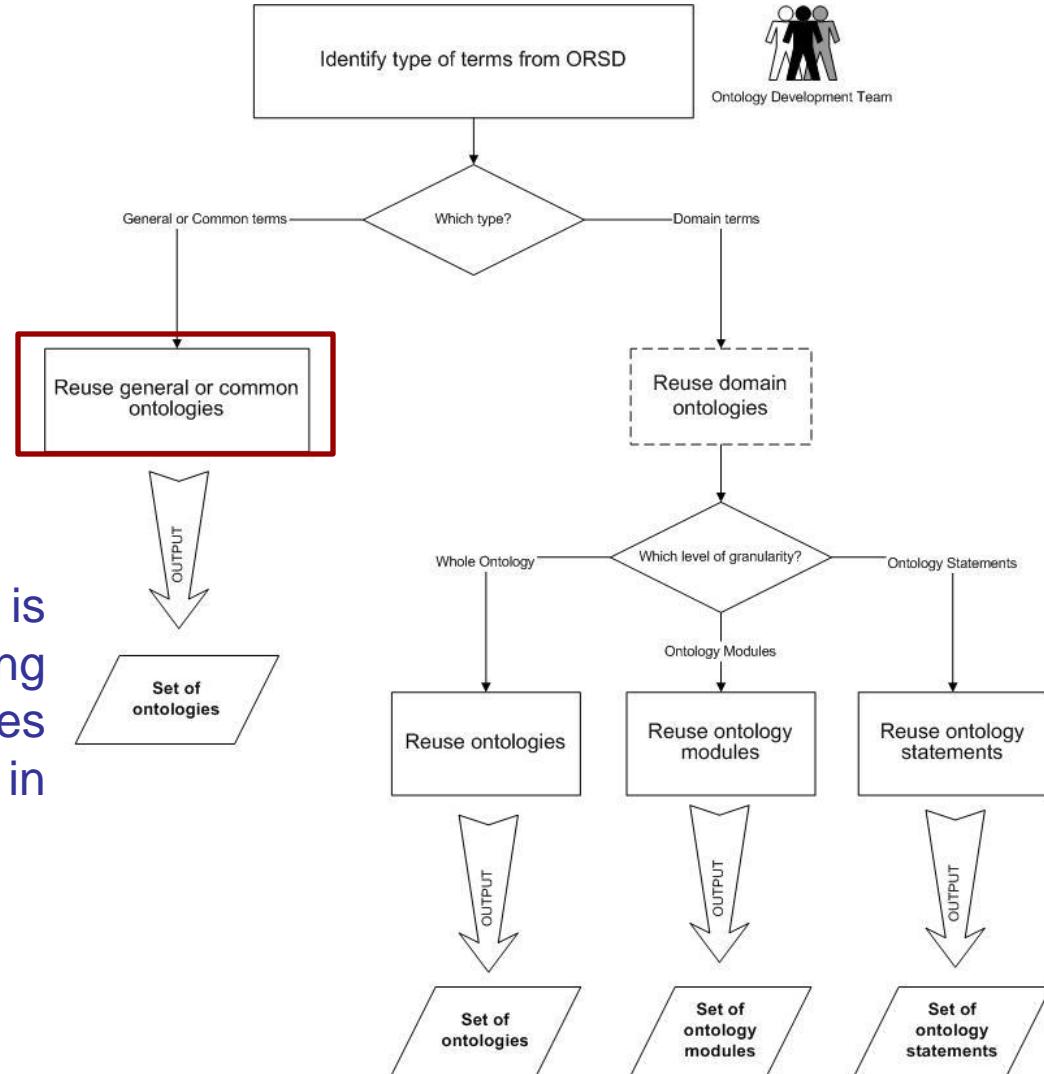
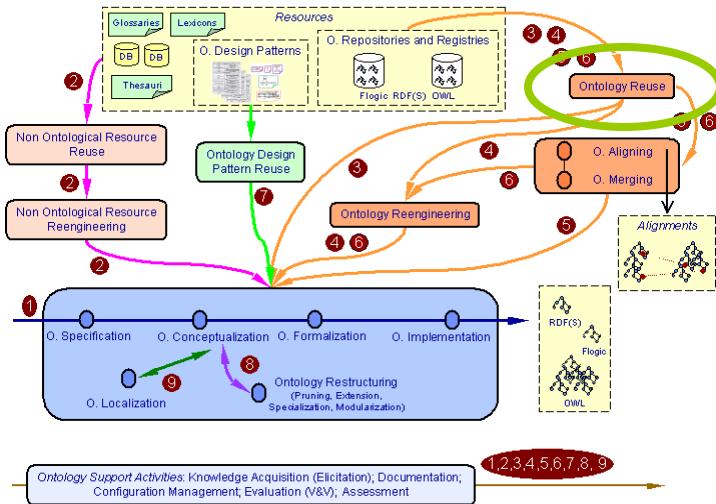


SEEMP



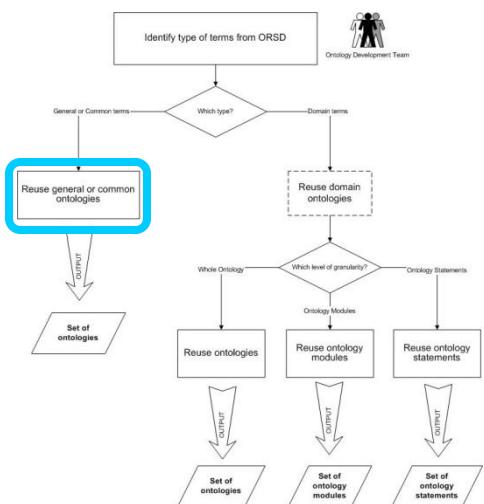


Ontological Resource Reuse Process



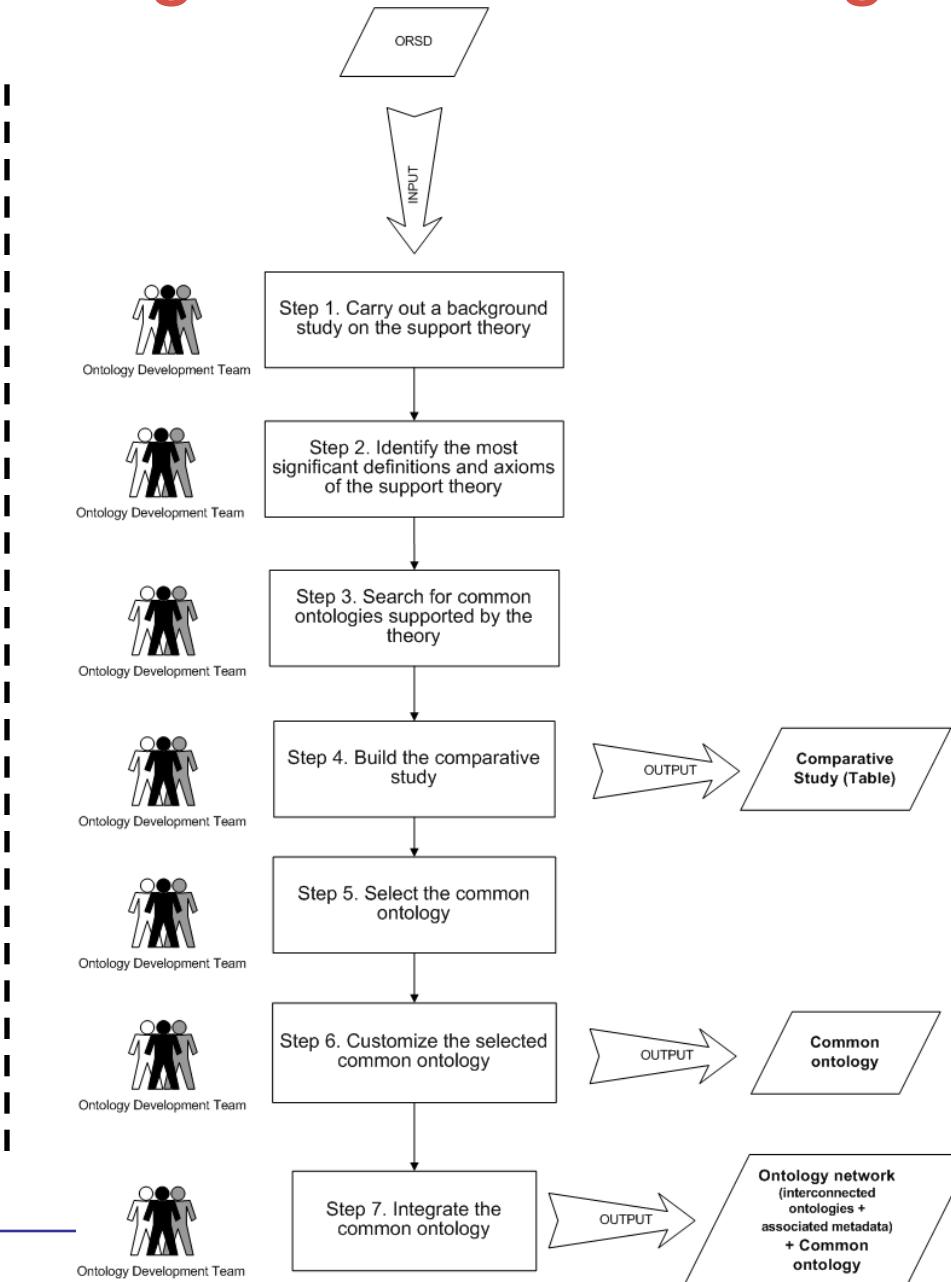
- **Ontological Resource Reuse** is defined as the process of using available ontological resources (ontologies, modules, statements) in the solution of different problems.

Reusing Common Ontologies

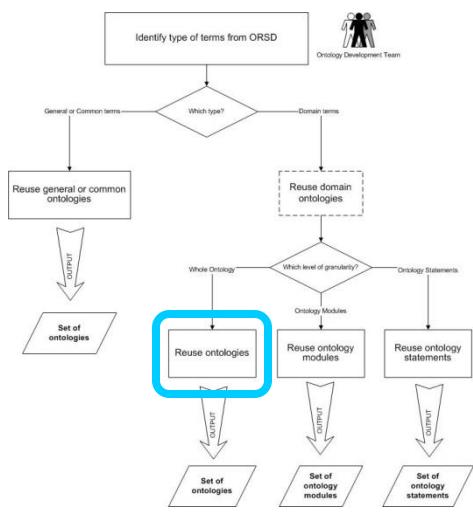


3 examples:

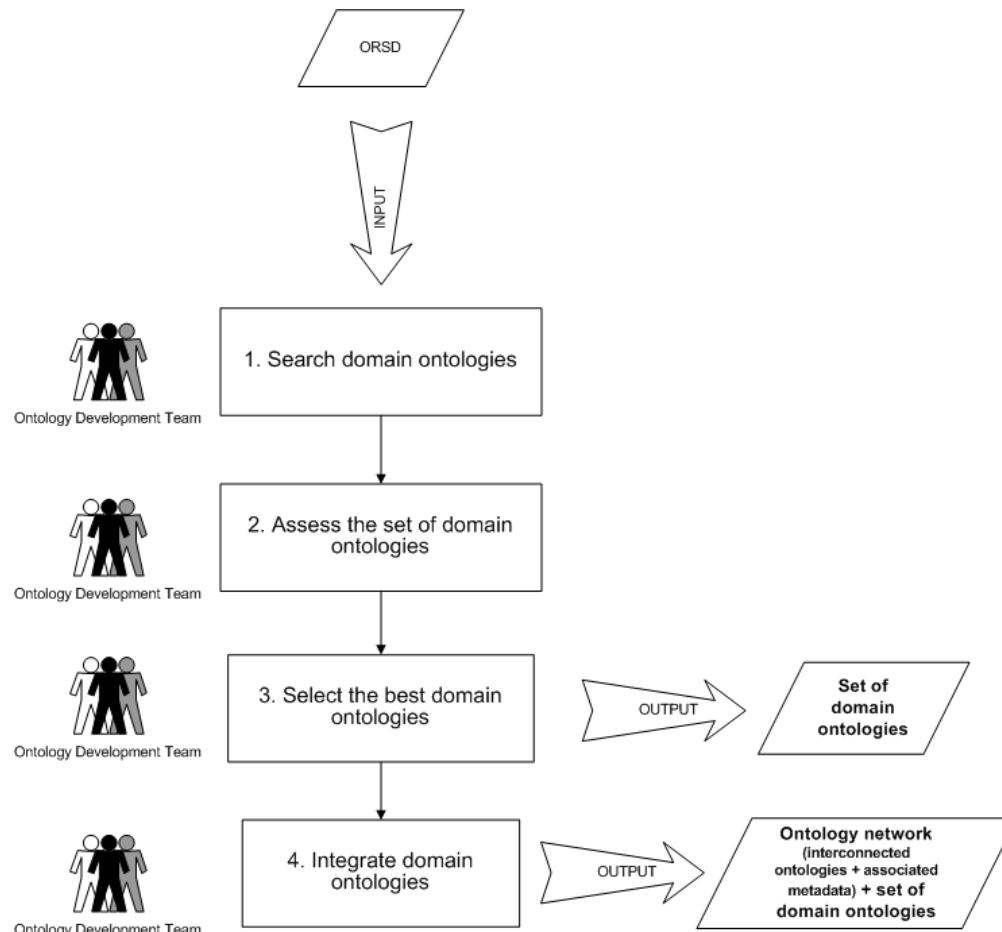
- SEEMP Project
- Invoice Use Case
- Nomenclature Use Case



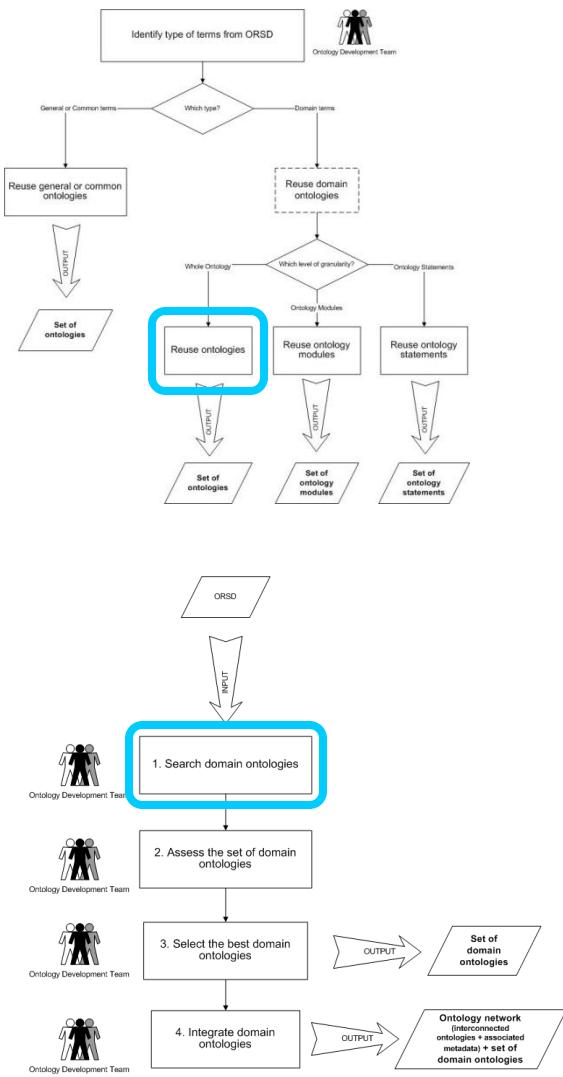
Reusing Ontologies as a Whole



Ontology Reuse is redefined as the activity of using ontologies (in this case domain ontologies) in the solution of different problems.



Reusing Ontologies as a Whole. Domain Ontology Search



Use ontology libraries and ontology repositories to search domain ontologies, using those terms that have a high frequency in the ORSD.

The screenshot shows a dual-pane interface. On the left is the Swoogle Semantic Web Search Engine, displaying search results for 'ontology search'. On the right is the Eclipse SDK Schema editor, showing the 'Entity Properties View' for the 'human' class in the 'ontology12' ontology.

Swoogle Semantic Web Search Engine - Microsoft Internet Explorer

Abrir Edición Ver Favoritos Herramientas Ayuda

Dirección: http://swoogle.umbc.edu/index.php?option=com_frontpage&service=search&queryType=search_swole_ontology&searchString=publicationSearchStart=1 Ir Vinculos >

Google Swoogle Go! Bookmarks 348 blocked Autopilot Send to... swoogle Settings

Swoogle semantic web search

list ontologies matching ontology search

ontology document publication

ontology12

Oyster - rapOntos

[DEF] PhD Semantic WebI

http://swrc.jhu.edu [DEF] Public Semantic WebI

http://owl.man.ac.uk [DEF] Member Semantic WebI

http://www.jhu.edu [DEF] Public Semantic WebI

http://inference.man.ac.uk [DEF] Proven Semantic WebI

http://caim.ncl.ac.uk [DEF] Proven Semantic WebI

http://ebiquity.mse.tufts.edu [DEF] InProc Semantic WebI

http://spire.csail.mit.edu [DEF] desceng Semantic WebI

ontology12

Scope

Local Peer Automatic Search Selected Peers Change...

Search

Search Now Stop Search Clear

Search Details

Ontology Name

Ontology Type

URL

Language

Status

Ontology Language

Ontology Syntax

Keywords

License

Creator

Contributor

Namespace

Top

- + Shopping
- + Computers
- + News
- + World
- + Science
- + Health
- + Arts
- + Games

Schema - Eclipse SDK

File Edit Navigate Search Project Run Window Help

Ontology Navigator Entity Properties View

Name: human
Namespace: "http://www.NewOnto1.org#"

Attributes:

Attribute	Range	Min	Max
son	range	Add relation to human	
attends	range	Add relation to human	
comment	'Modern man, the only remaining species of the Homo'		
genus	Add Literal in human		

Properties Watson Results View

son range Add relation to human

attends range Add relation to human

comment "Modern man, the only remaining species of the Homo" Add Literal in human

genus: "Add relation from human"

http://kmi-web05.open.ac.uk:81/cache/1/f5d/857a/f0cae/b9b6c6b3ac/1e19b0c5cf7f2a849#Human

http://kmi-web05.open.ac.uk:81/cache/0/339/c2ff/21d76/1013cd189c/557c6d296bd6957c#Human

http://onto.cs.yale.edu:8080/umlis/UMLSinDAML/.NET/SRDEF#Human

subClassOf Mammal Add relation from human

http://kmi-web05.open.ac.uk:81/cache/9/2b9/d184/eecdcc/efe52ea651/d0b87f986918a81c4#Human

http://kmi-web05.open.ac.uk:81/cache/8/6e8/368c/58d32/e93217cae8/23bc158d81684b28c#Human

http://edge.cs.drexel.edu/assemblies/ontologies/woolly/2004/06/flows.owl#Human

subClassOf Material Add relation from human

disjointWith Liquid Add relation from human

Reusing Ontologies as a Whole. Domain Ontology Assess

Are the found ontologies useful?

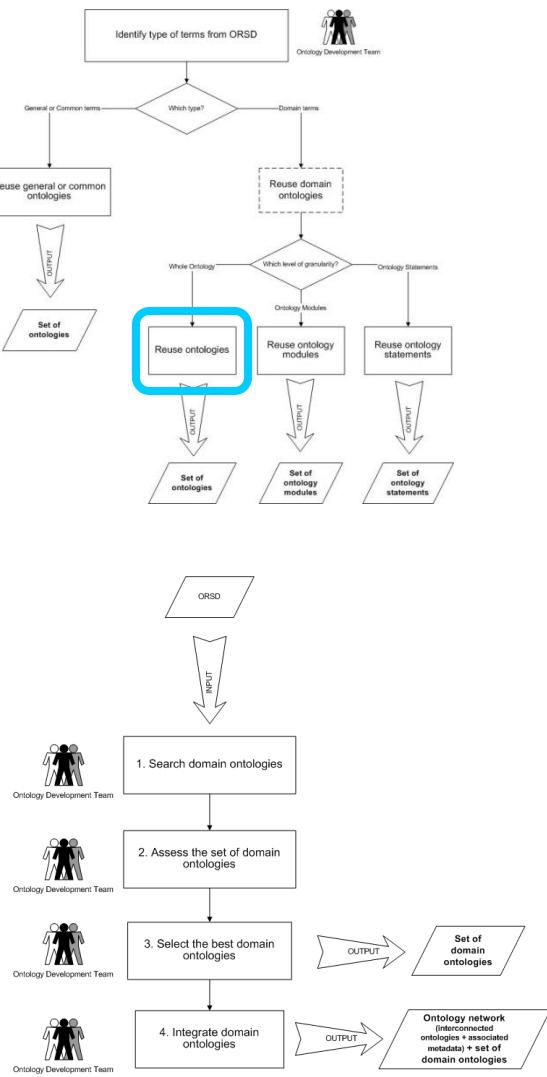
- Check the terminology in the CQs in the found ontologies
- Other requirements: language, standardized terms, multilinguality, etc.

Which ones are the best?

- Good documentation
- Modular ontology
- Integration effort is low.
- Ontology is reused by others.
- If the ontology used naming conventions.
- If the ontology have been evaluated.

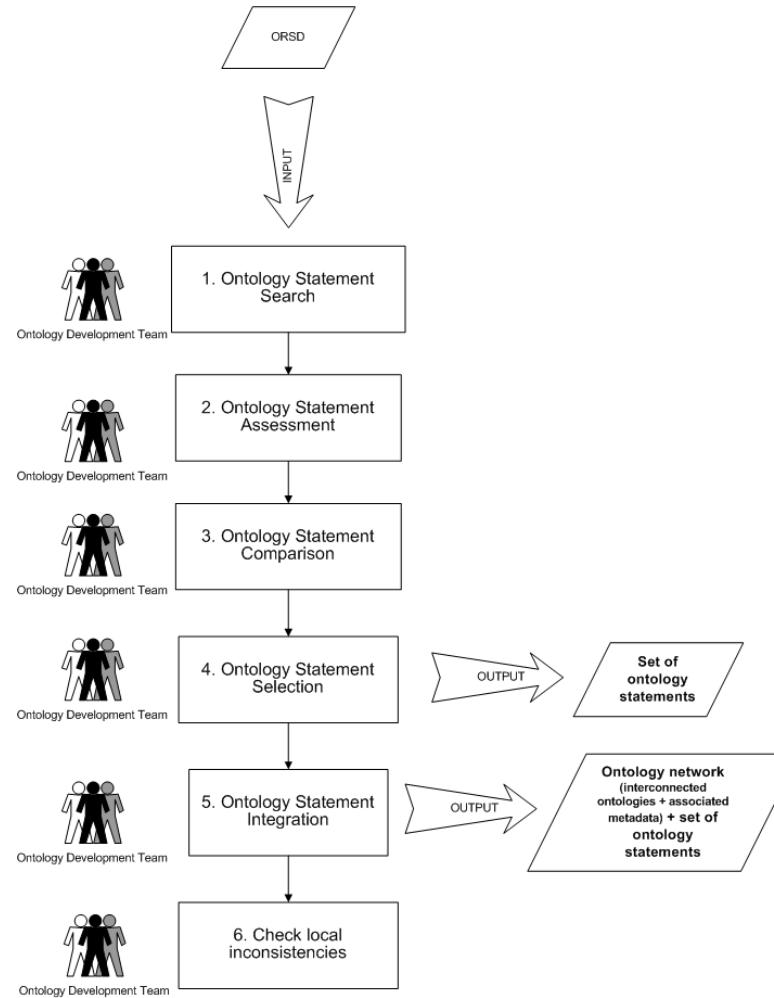
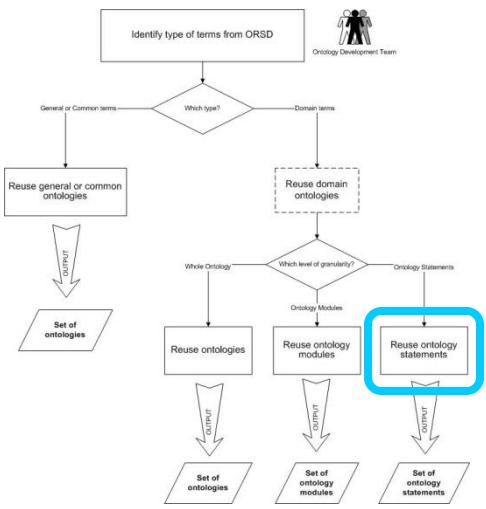
How do I integrate?

- Reused as it is.
- Ontology reengineering
- Ontology merge



Reusing Ontology Statements

Ontology Statement Reuse is defined as the activity of using ontology statements in the solution of different problems.



Ontology Navigator

- NewOntologyProject
 - >paella
 - Concepts
 - Food
 - Beverage
 - FoodCondiment
 - GrainFood
 - Meat
 - MeatOfLandAnimal
 - Seafood
 - PreparedFood
 - SpiceIngredient
 - Vegetables
 - KitchenEquipment
 - Pan

Entity Properties View

Name	Meat		
Namespace	"http://www.NewOnto1.org#"		
Attributes:			
Attribute	Range	Min	Max

Properties Watson Results View

Search results for: Meat

<http://kmi-web05.open.ac.uk:81/cache/d/f98/6a16/f9d98/8c9fa90adf/8ed3118eae323e337#Meat>

<http://www.w3.org/2001/sw/WebOnt/guide-src/food#Meat>

disjointWith	Fruit	Add relation from Meat
disjointWith	Dessert	Add relation from Meat
disjointWith	Seafood	Add relation from Meat
disjointWith	Fowl	Add relation from Meat
subClassOf	EdibleThing	Add relation from Meat
RedMeat	subClassOf	Add relation to Meat
NonRedMeat	subClassOf	Add relation to Meat
OtherTomatoBasedFood	disjointWith	Add relation to Meat
Pasta	disjointWith	Add relation to Meat

<http://www.w3.org/2002/03owl/misCELLANEOUS/consistent002#Meat>

Instance View

```

graph TD
    A[1. Ontology Statement Search] --> B[2. Ontology Statement Assessment]
    B --> C[3. Ontology Statement Comparison]
    C --> D[4. Ontology Statement Selection]
    D --> E[5. Ontology Statement Integration]
    E --> F[6. Check local inconsistencies]
    
```

1. Ontology Statement Search

2. Ontology Statement Assessment

3. Ontology Statement Comparison

4. Ontology Statement Selection

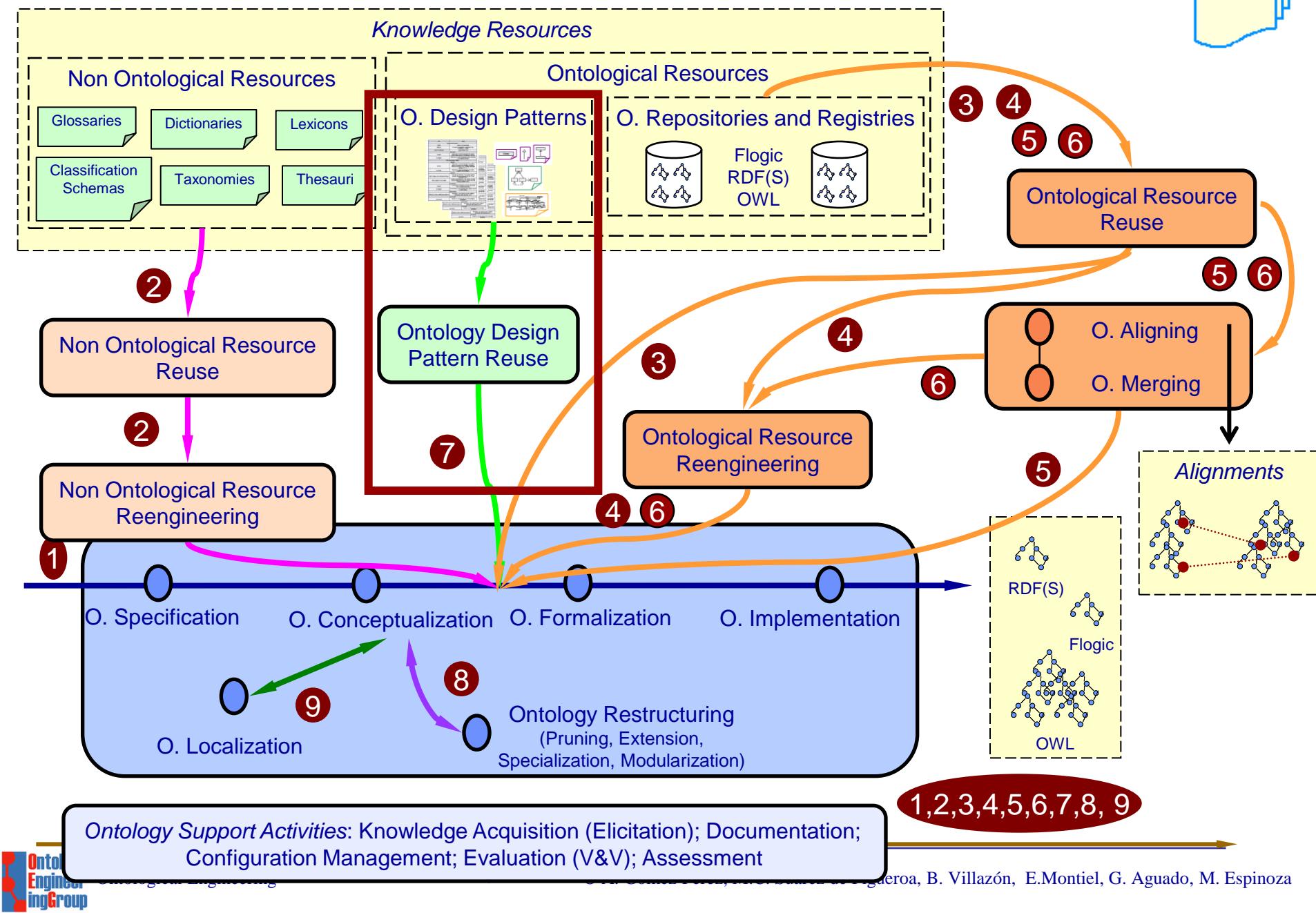
5. Ontology Statement Integration

6. Check local inconsistencies

Ontology Development Team

Set of ontology statements

Ontology network (interconnected ontologies + associated metadata + set of ontology statements)



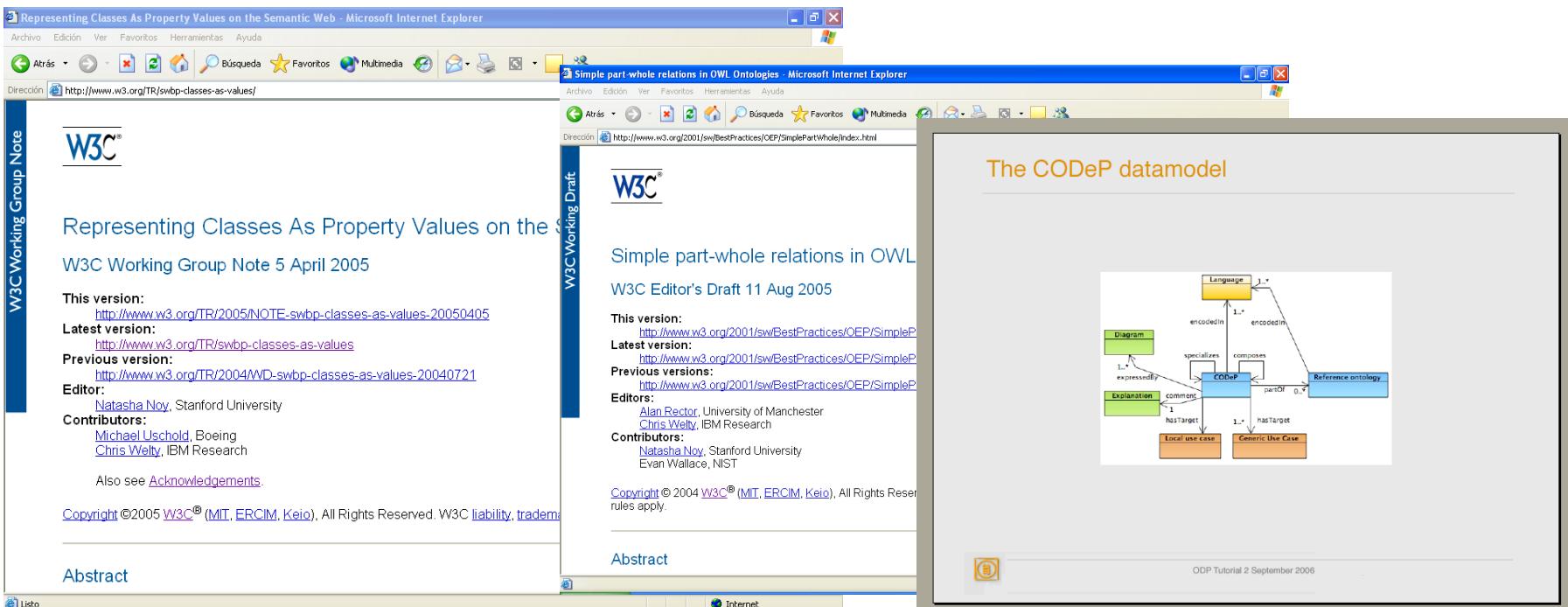
Patterns

Pattern is something proposed for imitation.

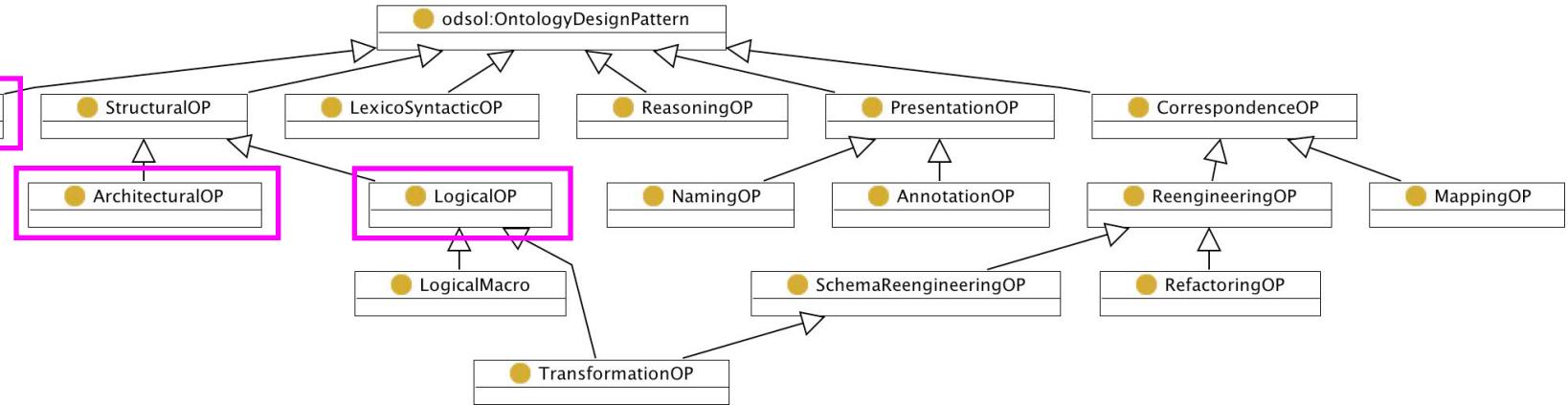
Design Pattern refers to shared guidelines that help solve design problems.

Ontology Design Pattern (ODP) is a modeling solution to solve a recurrent ontology design problem.

Our concept of “pattern” is associative with the wider “good/best practice” of software engineering. It includes a wider range of solution types. For example: naming conventions in software engineering are considered good practices, they are not design patterns.



Types of Ontology Design Patterns



Content OPs (CPs) encode conceptual, rather than logical design patterns.

Logical OPs solve design problems independently of a particular conceptualization.

CPs propose patterns for solving design problems for the domain classes and properties that populate an ontology. They address content problems.

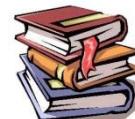
A **Logical OP** is a formal expression, whose only parts are expressions from a logical vocabulary e.g., OWL DL, that solves a problem of expressivity.
Logical OPs are independent from a specific domain of interest i.e. they are content-independent

Architectural OPs affect the overall shape of the ontology: their aim is to constrain ‘how the ontology should look like’.

Inventory of Patterns (I)

- *General Information:*
 - Name
 - Identifier
 - Ontology modelling component type (LP, AP and CP)
- *Use Case*, or problem to be addressed.
- *Ontology Design Pattern*, or proposed solution in different formats.
- *Relations to other ontology model components*. This slot is optional.
- *Comments*. This slot is also optional.

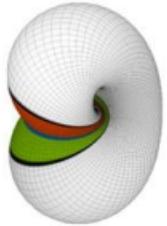
Slot	Value
General/Information	
Name	Name of the component
Identifier	An acronym composed of component type + component identifier
Type of Component	Logical Patient (LP)
Use Case	
General	Description in natural language of the general problem addressed by the modeling component.
Example	Description in natural language of some examples related to the general problem.
Ontology Design Pattern	
Internal	
General	Description in natural language of the general solution provided by the modeling component, relating to the Use Case. It must be detailed in ODL.
Example	Description in natural language of the solution applied to the examples.
Graphical	
UML / Diagram for the General Solution	Graphical representation of the general solution provided taking into account the UML. Private (internal) UML diagrams.
UML / Diagram for Examples	Graphical representation of the solution provided, using examples and taking into account the UML. Public proposed in XML.
Formulation	
General	Formulation of the pattern in terms of the NeOn ODL Ontology Reference.
Example	Formulation of the example using abstract syntax of ODL (optional).
Relationships	
Relations to other modeling components	Description of any relation to other modeling components (use, association, etc.).
Comments	
Comments	Remarks clarifying the use of the modeling component.



NeOn Deliverable D5.1.1

Inventory of Patterns (II)

<http://ontologydesignpatterns.org>



This screenshot shows a category page from the Ontology Design Patterns website. The page title is "Category:ProposedContentOP". It includes a sidebar with navigation links for Main page, Modeling Issues, Reviews, Feedback, Domains, Training, Events, Request an ODP account, How to post a Content OP, Post a Content OP, Add a Domain, Post your Feedback, Post a modeling issue, List of Categories, and List of Properties. The main content area lists 41 pages in the category, with a specific link to "Submissions:AgentRole" highlighted with a pink border.

category discussion view source history

Category:ProposedContentOP

This category uses the form Content OP Proposal Form.
Reviews about articles in this Category will use Form:Content OP Proposal Review Form

Pages in category "ProposedContentOP"

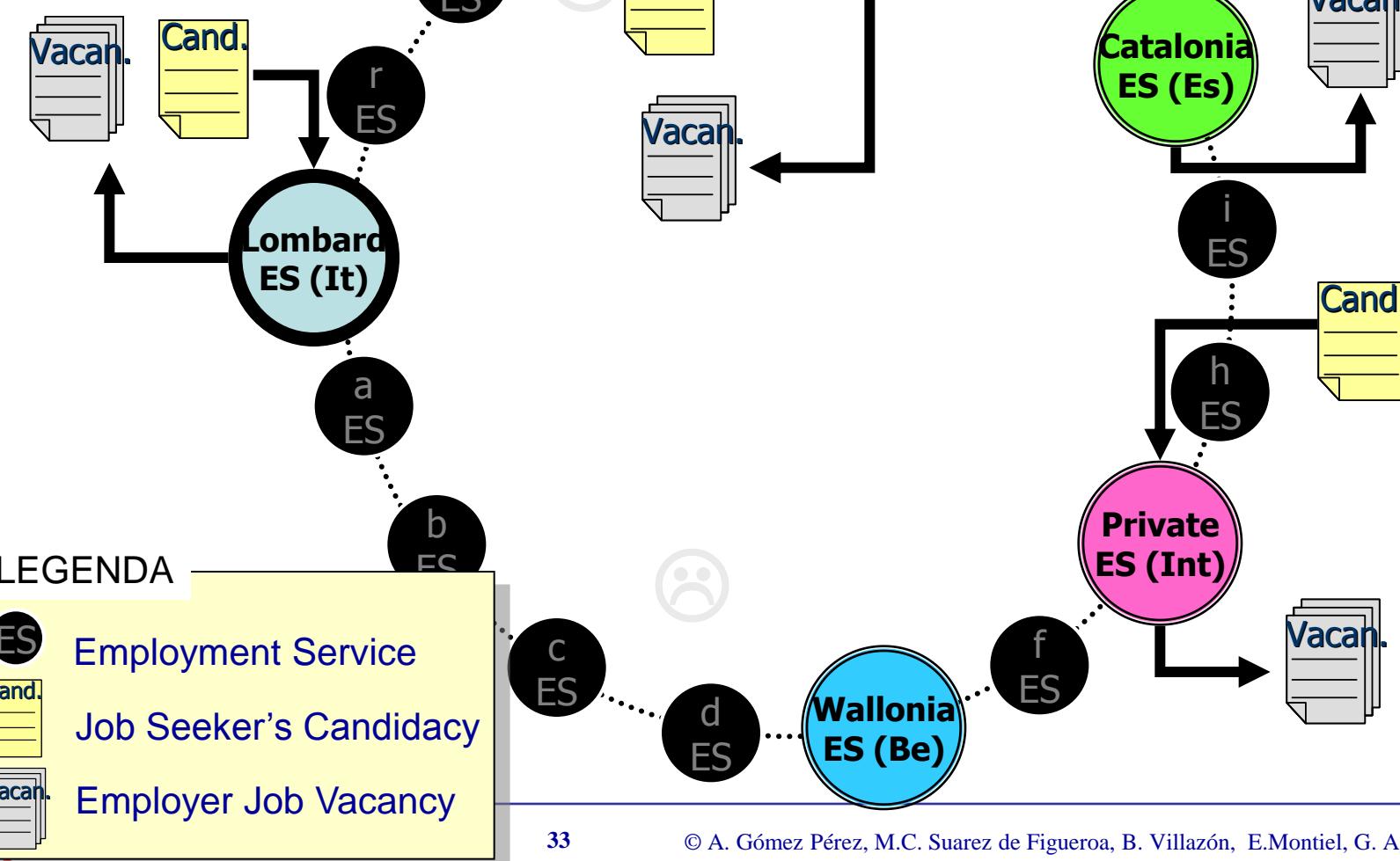
The following 41 pages are in this category, out of 41 total.

<p>S</p> <ul style="list-style-type: none">■ Submissions:AgentRole■ Submissions:AquaticResourceObservation■ Submissions:AquaticResources■ Submissions:Biological Entities■ Submissions:Classification■ Submissions:Co-participation■ Submissions:CollectionEntity■ Submissions:Componency■ Submissions:Constituency■ Submissions:Description■ Submissions:GO Top■ Submissions:GearSpecies■ Submissions:GearVessel	<p>S cont.</p> <ul style="list-style-type: none">■ Submissions:GearWaterArea■ Submissions:HasPest■ Submissions:Information realization■ Submissions:Invoice■ Submissions:Metonymy-species-commodity■ Submissions:Nary Participation■ Submissions:Objectrole■ Submissions:Observation■ Submissions:PartOf■ Submissions:Participation■ Submissions:PharmaInnova■ Submissions:RTMSmapping■ Submissions:Role task■ Submissions:Sequence	<p>S cont.</p> <ul style="list-style-type: none">■ Submissions:SimpleTopic■ Submissions:Situation■ Submissions:SpeciesBathymetry■ Submissions:SpeciesConditions■ Submissions:SpeciesConservation■ Submissions:SpeciesEat■ Submissions:SpeciesHabitat■ Submissions:SpeciesNames■ Submissions:TaskExecution■ Submissions:TimeIndexedPartOf■ Submissions:TimeInterval■ Submissions:Types of entities■ Submissions:VesselSpecies■ Submissions:VesselWaterArea
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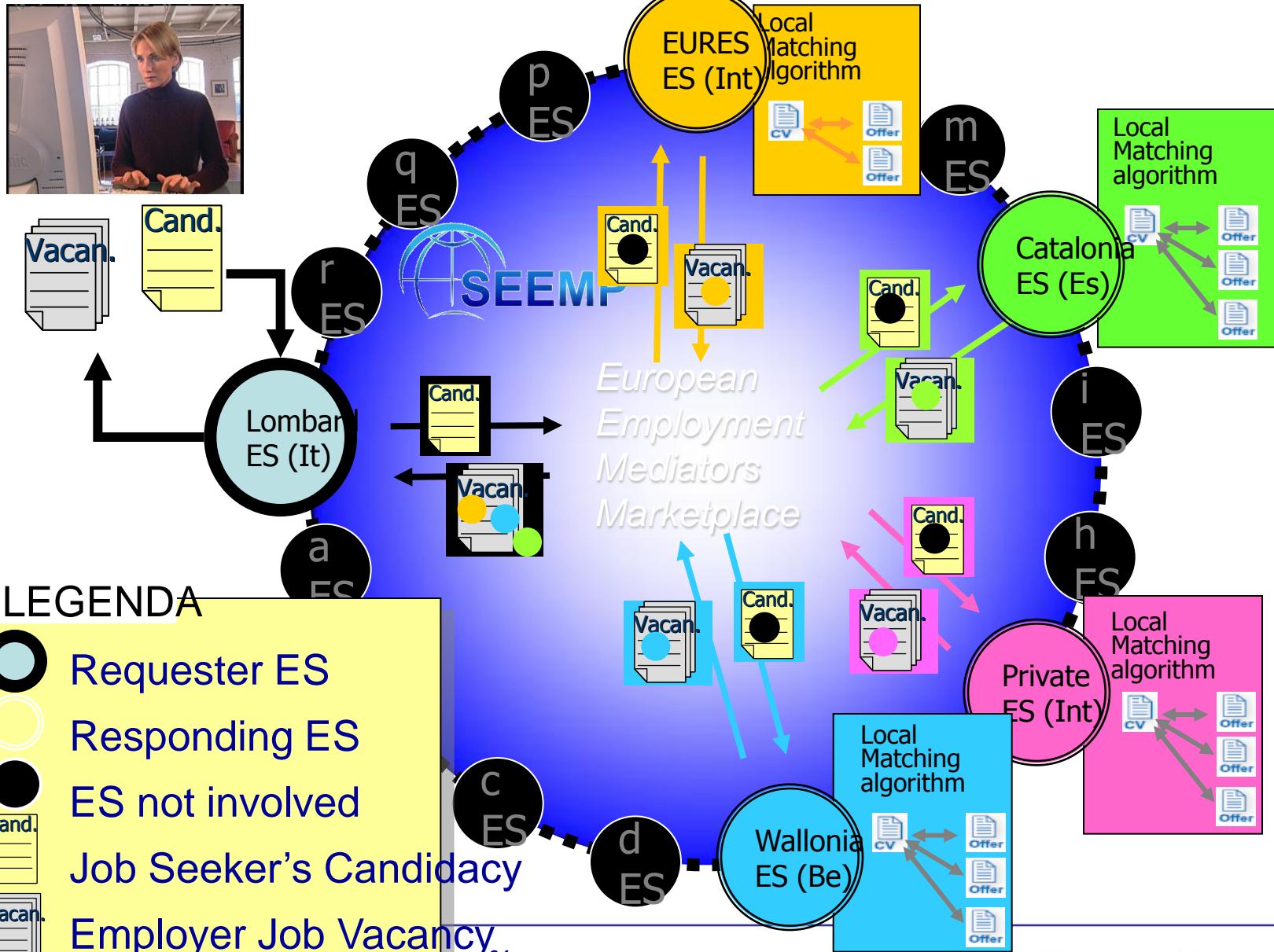


NeOn Deliverable D2.5.1

Looking for an European Employment



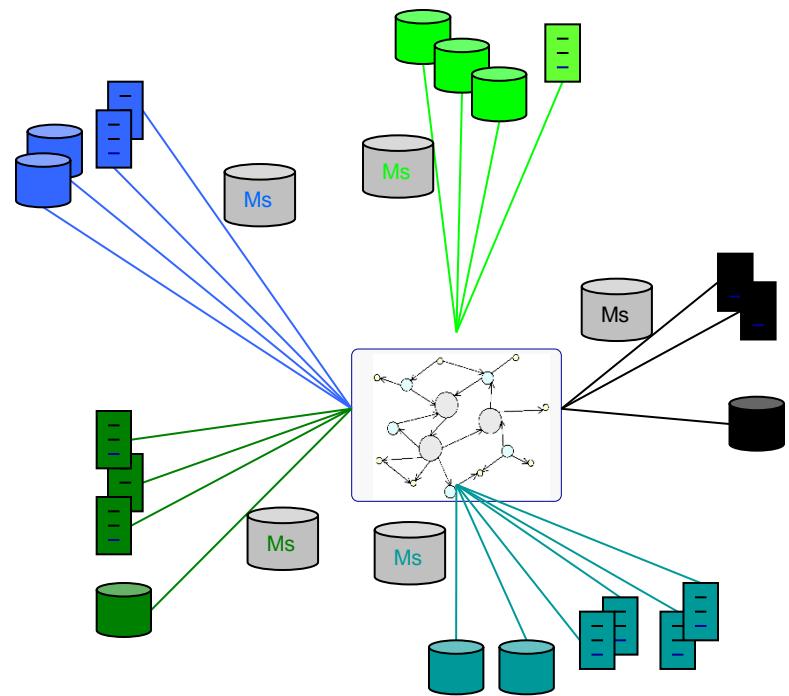
The Goal: Helping Job Seekers on their way



Key aspects of Ontological Engineering

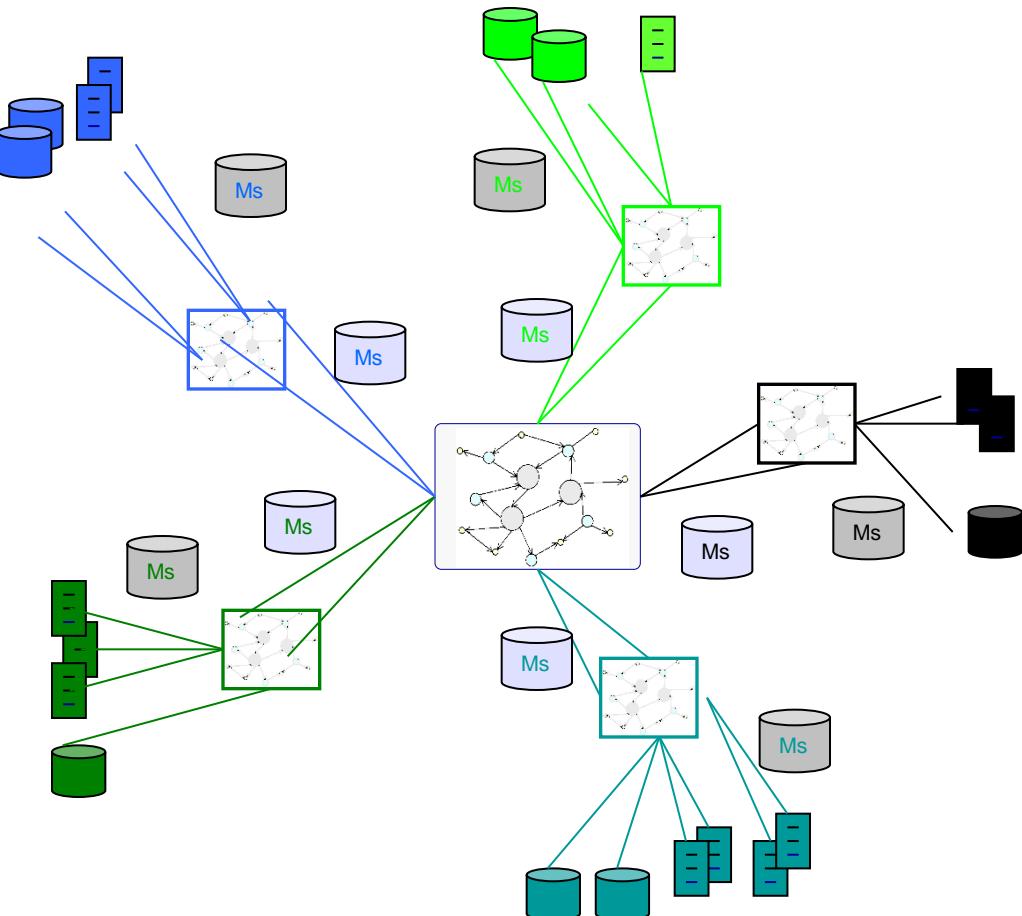
- **Ontologies**
 - Single versus network of ontologies?
 - Are ontologies built from scratch or reusing knowledge-aware resources?
 - Are mappings used for solving conceptual mismatches?
- **Instances**
 - Where are the data/instances?
 - Instances are in the ontology
 - Instances are in RDF files independently of the ontology
 - Data are kept in the original sources
 - Are instances distributed or centralized?
 - Have instances a very high rate of changes?
 - Heterogeneous provenance of instances
 - Degrees of data quality
 - Permissions

Centralized network of ontologies



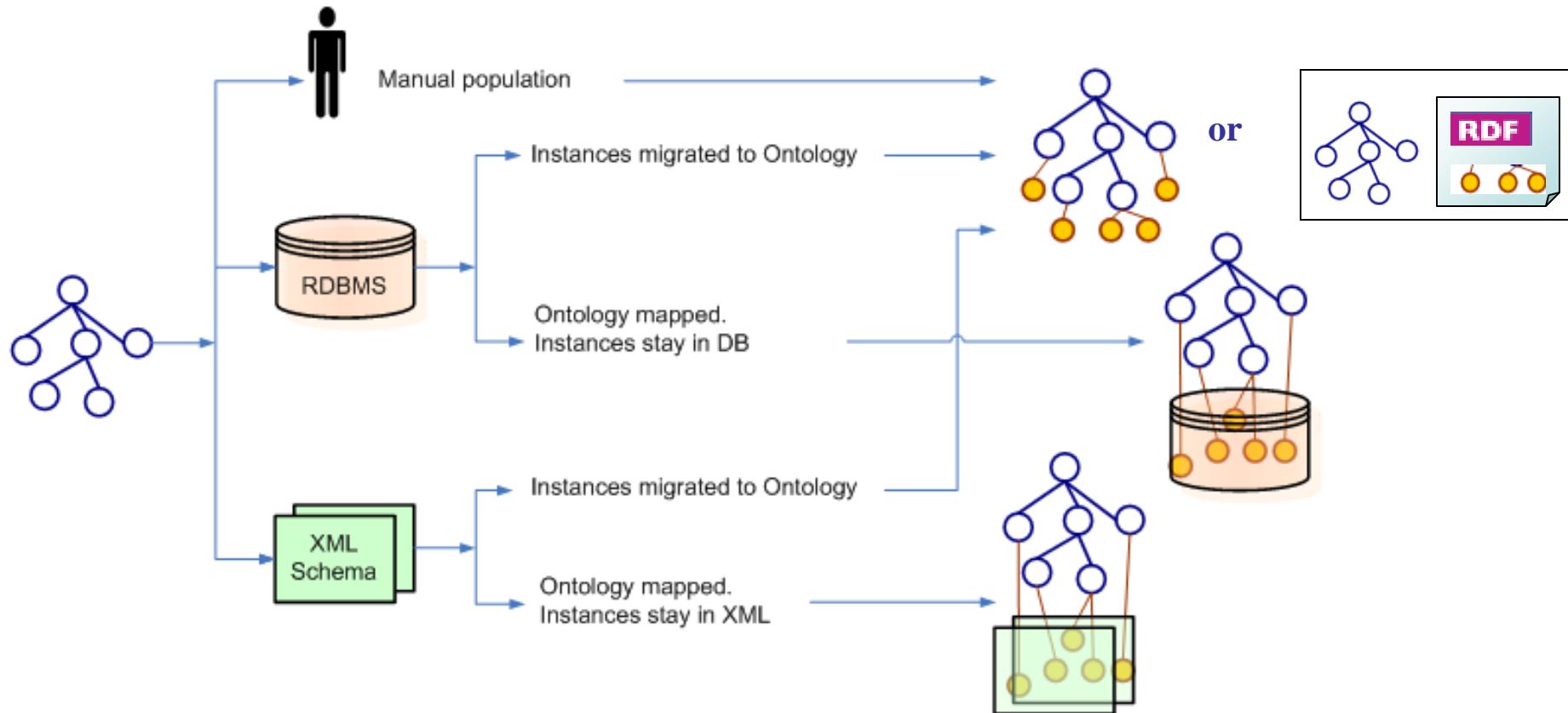
1. Build a reference ontology
2. Build mappings between the reference ontology and the data sources

Federated network of ontologies

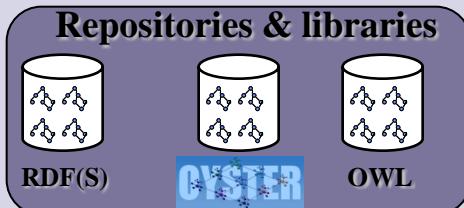


1. Build a reference ontology for the domain
2. Build local ontologies
3. Build mappings between the core and local ontologies
4. Build mappings between the local ontologies and the data sources

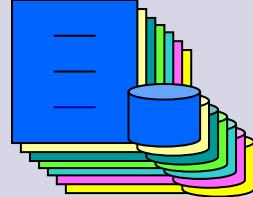
Where are the instances?



ISCO-88 (COM),
ONET,
EURES taxonomy,
FOET, ISCED97,
NACE, ISO 4217,
ISO 3166, ISO 6392,
HR-XML, ...



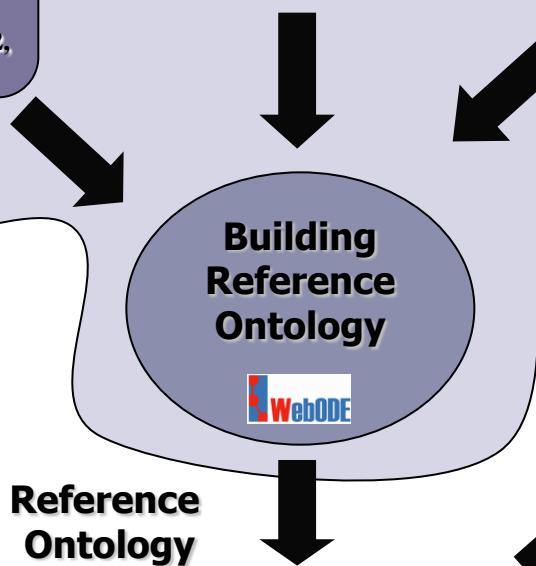
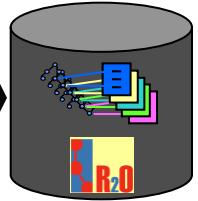
ES Data Sources



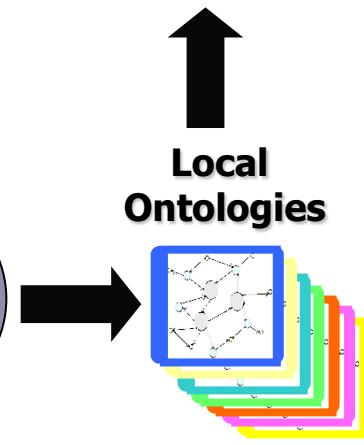
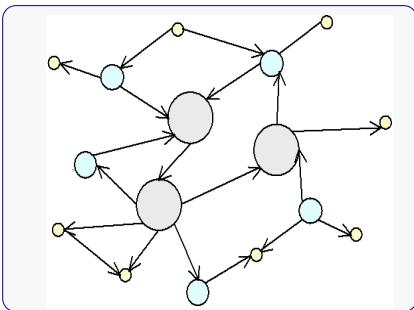
Building Mappings L.O. - ES Data Sources



Mappings L.O. - ES Data Sources



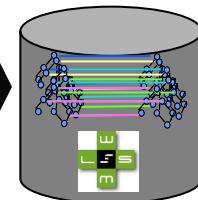
Reference Ontology



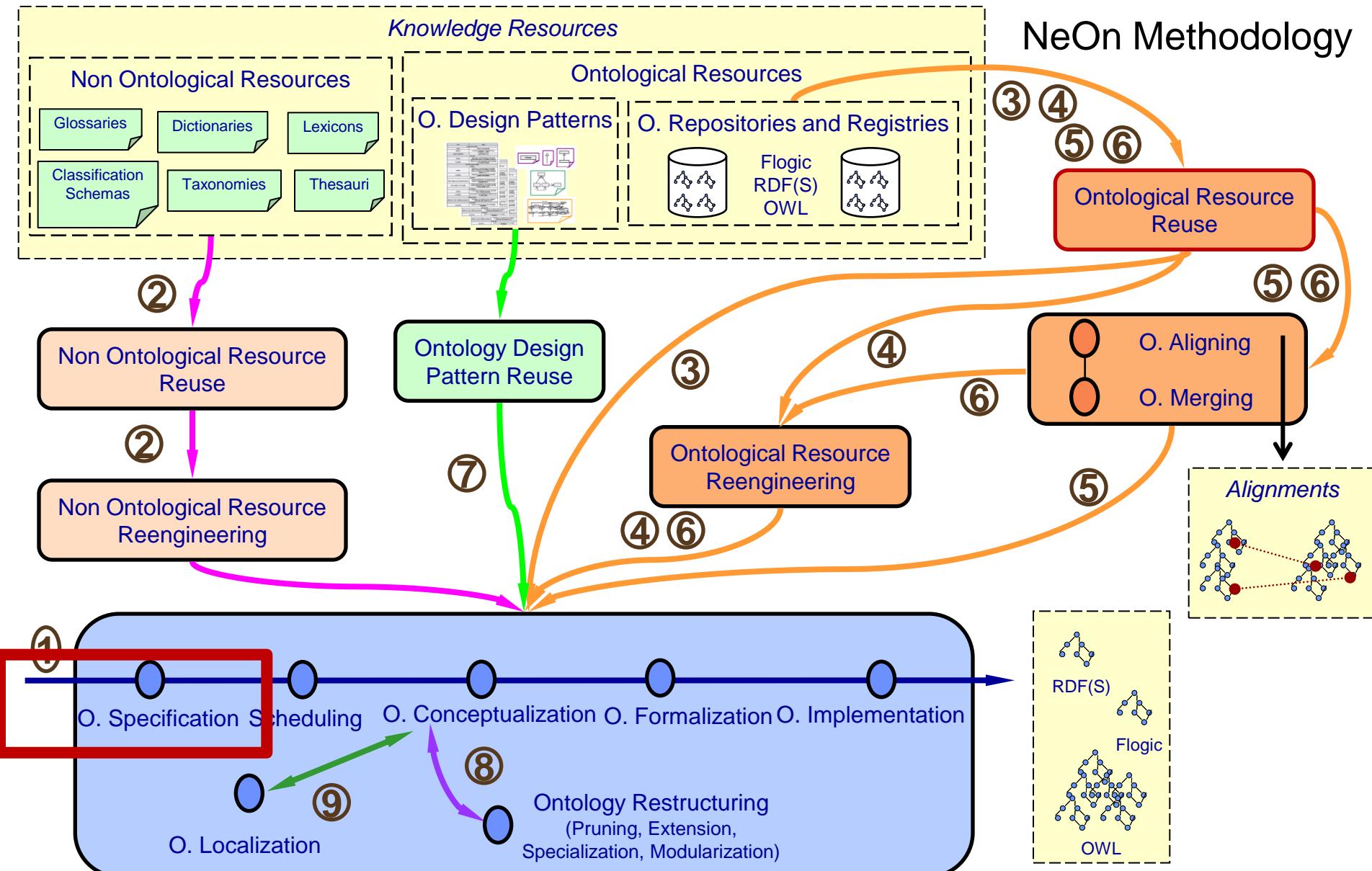
Building Mappings R.O. - L.O.



Mappings R.O. - L.O.



NeOn Methodology

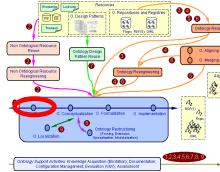


Ontology Support Activities: Knowledge Acquisition (Elicitation); Documentation; Configuration Management; Evaluation (V&V); Assessment

eroa, B. Villazón, E. Montiel, G. Aguado, M. Espinoza

Ontology Specification.

The Ontology Requirement Specification Document

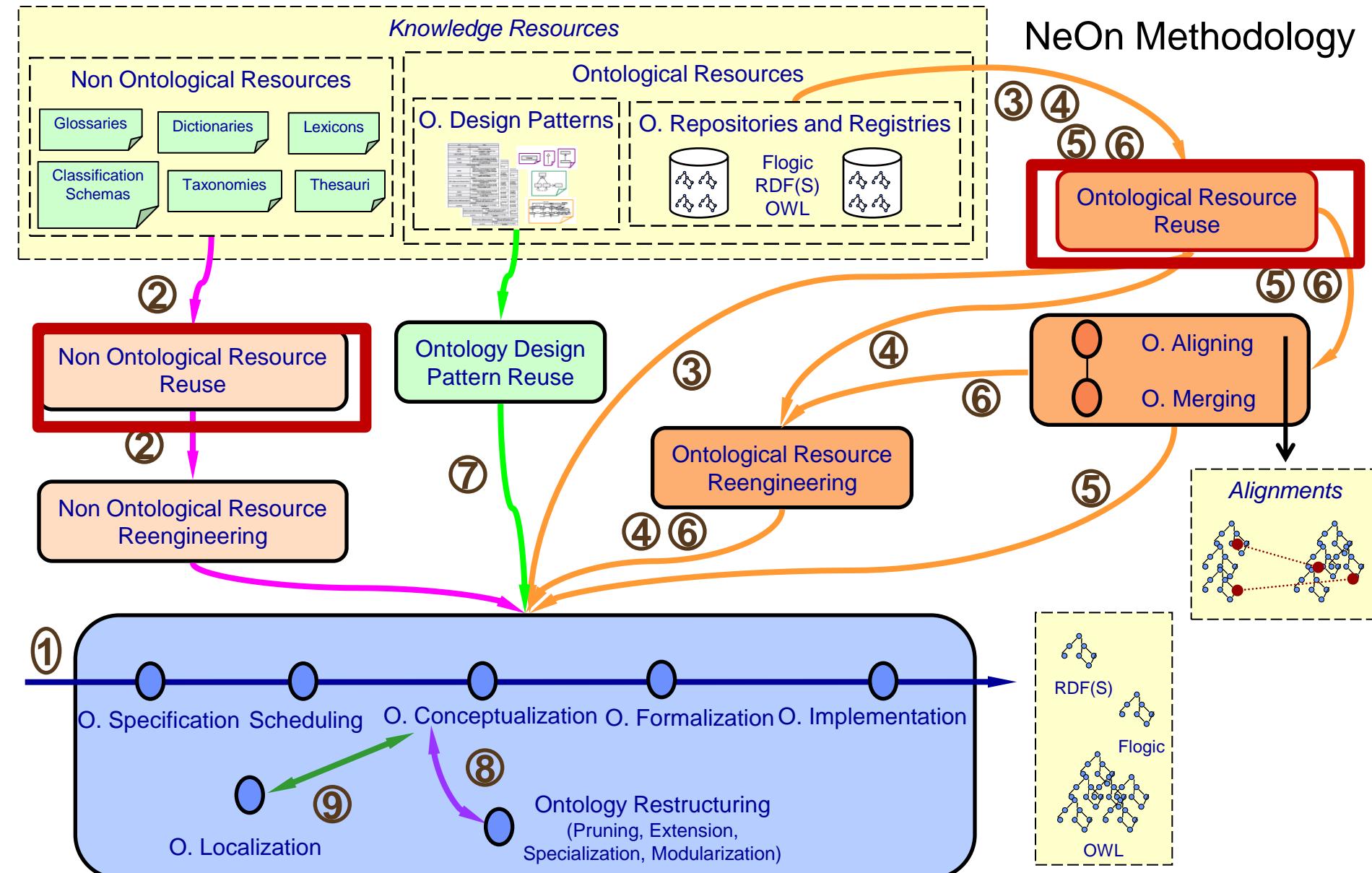


SEEMP Reference Ontology Requirements Specification	
1 Purpose	The purpose of building the Reference Ontology is to provide a consensual knowledge model of the employment domain that could be used by public e-Employment services (PES).
2 Scope	
The ontology has to focus just on the ICT (Information and Communication Technology) domain. The level of granularity is directly related to the competency questions and terms identified.	
3 Level of Formality	
The ontology has to be implemented in WSML language	
4 Intended Users	
User 1.	Candidate who is unemployed and searching for a job or searching another occupation for immediate or future purposes
User 2.	...
User 3.	...
User 4.	...
User 5.	...

Pre-Glossary of Terms		
	Terms	Frequency
User 1.	a. Job Seeker	27
User 2.	b. CV	2
User 3.	c. Personal Information	3
User 4.	d. Name	5
User 5.	e. Gender	1
5 Intend	f. Birth date	1
Use 1.	g. Address	2
Use 2.	h. Nationality	1
Use 3.	i. Contact (phone, fax, mail)	4
Use 4.	j. Objective	3
Use 5.	k. Job Category	6
	l. Job Offer	27
	m. Employer Information	1
	n. Vacancy	1
	o. Activity Sector	1
	p. Location	3
	q. Work Condition	3
	r. Contract Type	3
	s. Salary	3
	t. Education	3
	u. Work Experience	3

6 Groups of Competency Questions		
	CQG1. Job Seeker (16 CQ)	<p>CQ1. What is the Job Seeker Name? CQ2. What is the Job Seeker nationality? CQ3. When is the Job Seeker birthday? CQ4. What is the Job Seeker contact information? CQ5. What is the Job Seeker current job? CQ6. What is the Job Seeker desired job? CQ7. What are the Job Seeker desired working conditions? CQ8. What kind of contract does the Job Seeker want?</p> <p>Job Seeker</p>
	CQG2. Job Offer (10 CQ)	<p>CQ17. What is the employer information? CQ18. What kind of job does the employer offer? CQ19. What kind of contract does the employer offer? CQ20. How much salary does the employer offer? CQ21. What is the economic activity of the employer?</p> <p>Job Offer</p>
	CQG3. Objects (10 CQ)	<p>Objects in the universe of discourse, which are instances of:</p> <ul style="list-style-type: none"> Job Category <ul style="list-style-type: none"> O1. Computer System Designer O2. Computer System Analyst O3. Programmer O4. Computer Engineer O5. Computer Assistant O6. Computer Equipment Operator O7. Industrial Robot Controller O8. Telecommunication Equipment Operator O9. Medical Equipment Operator O10. Electronic Equipment Operator O11. Image Equipment Operator Nationality <ul style="list-style-type: none"> O12. Austrian O13. Belgian O14. Danish O15. Estonian O16. Finnish O17. French O18. German O19. Greek O20. Italian Activity Sector <ul style="list-style-type: none"> O21. Telecommunication O22. Justice and Judicial O23. Public Security and law O24. Manufacture of machine tools O25. Research and Development O26. Hardware Consultancy O27. Software Consultancy and Supply O28. Data processing

NeOn Methodology

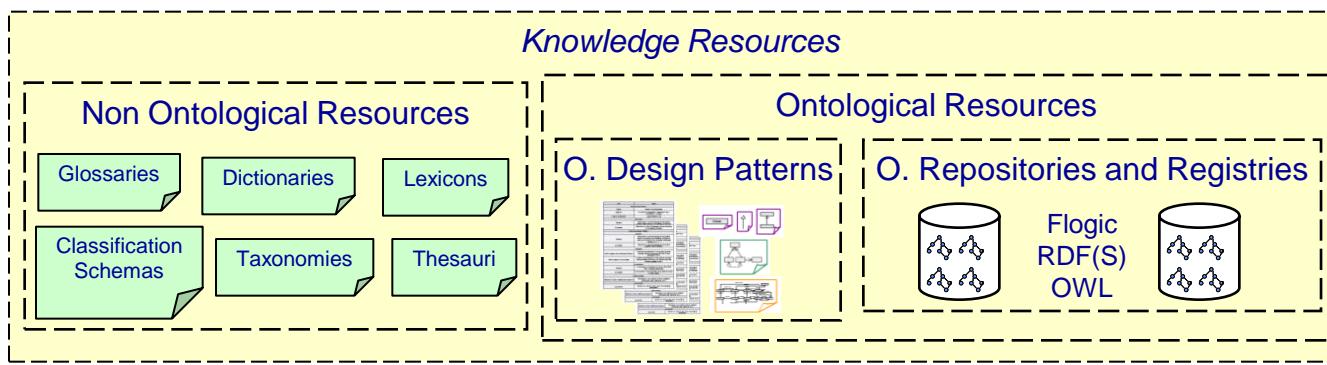


Ontology Support Activities: Knowledge Acquisition (Elicitation); Documentation; Configuration Management; Evaluation (V&V); Assessment

A. Gómez, B. Villazón, E. Montiel, G. Aguado, M. Espinoza

Searching Resources

- Use the terminology from the ORSD
- Find resources covering the terminology



Objects
Objects in the universe of discourse, which are instances of:
<ul style="list-style-type: none"> • Job Category <ul style="list-style-type: none"> O1. Computer System Designer O2. Computer System Analyst O3. Programmer O4. Computer Engineer O5. Computer Assistant O6. Computer Equipment Operator O7. Industrial Robot Controller O8. Telecommunication Equipment Operator O9. Medical Equipment Operator O10. Electronic Equipment Operator O11. Image Equipment Operator • Nationality <ul style="list-style-type: none"> O12. Austrian O13. Belgian O14. Danish O15. Estonian O16. Finnish O17. French O18. German O19. Greek O20. Italian

- Where:
 - Internet
 - Standardization bodies (ISO,...)
 - Intranet of the organization
 - Ontology Registries



Search and Select non-ontological resources

- We select the most appropriate standards and taxonomies for:
 - Occupation Classification
ISCO-88 (COM), SOC, ISCO-88, ONET, Eures Taxonomy.
 - Classification of Economic Activities
ISIC Rev. 3.1, NACE Rev. 1.1, NAICS
 - Apprenticeship classifications
ISCED 97, FOET
 - Currency Classification
ISO 4217
 - Geography Classification
ISO 3166, Eures Taxonomy

Language Classification

ISO 6392, CEF

Driving License Classification

European Legislation

Skill Classification

Eures Taxonomy

Contract Types Classification

LE FOREM, Eures and BLL Classification

Work Condition Classification

LE FOREM, Eures and BLL Classification

Is the terminology included in
the Ontology Requirements Specification Document
covered by the resources?

Searching Ontologies in Watson

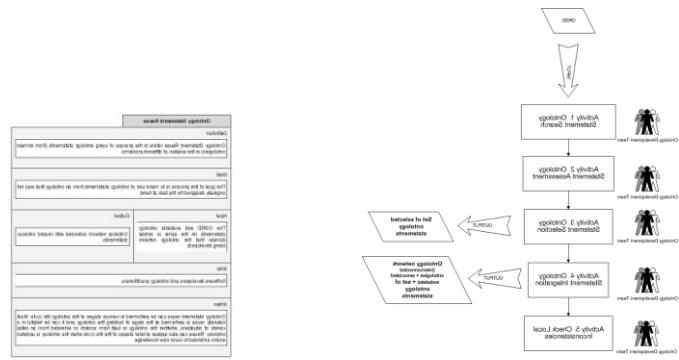
Ontology Requirement Specification Document

Objects
Objects in the domain of discourse, which are instances of:
Job Category
• Education
029. Life Science
030. Mathematics
031. Computer Science
032. Computer Use
033. Statistics
034. Physics
035. Network Administration
• Languages
036. Swedish
037. Spanish
038. Slovenian
039. Portuguese
040. English
041. French
042. German
• Currency
043. Euro
044. Krone
045. Great British Pound
046. Zlate
047. US Dollar
048. Franc
• Location
049. Austria
050. Belgium
051. Denmark
052. France
053. Finland
054. France
055. Germany
056. Greece
• Nationality
012. Austrian
013. Belgian
014. Danish
015. Estonian
016. Finnish
017. French
018. German
019. Greek
020. Italian
• Activity Sector
021. Telecommunication
022. Justice and Judicial
023. Public Security and law
024. Manufacture & Machine tools
025. Research and Development
026. Hardware Consultancy
027. Software Consultancy and Supply
028. Data processing

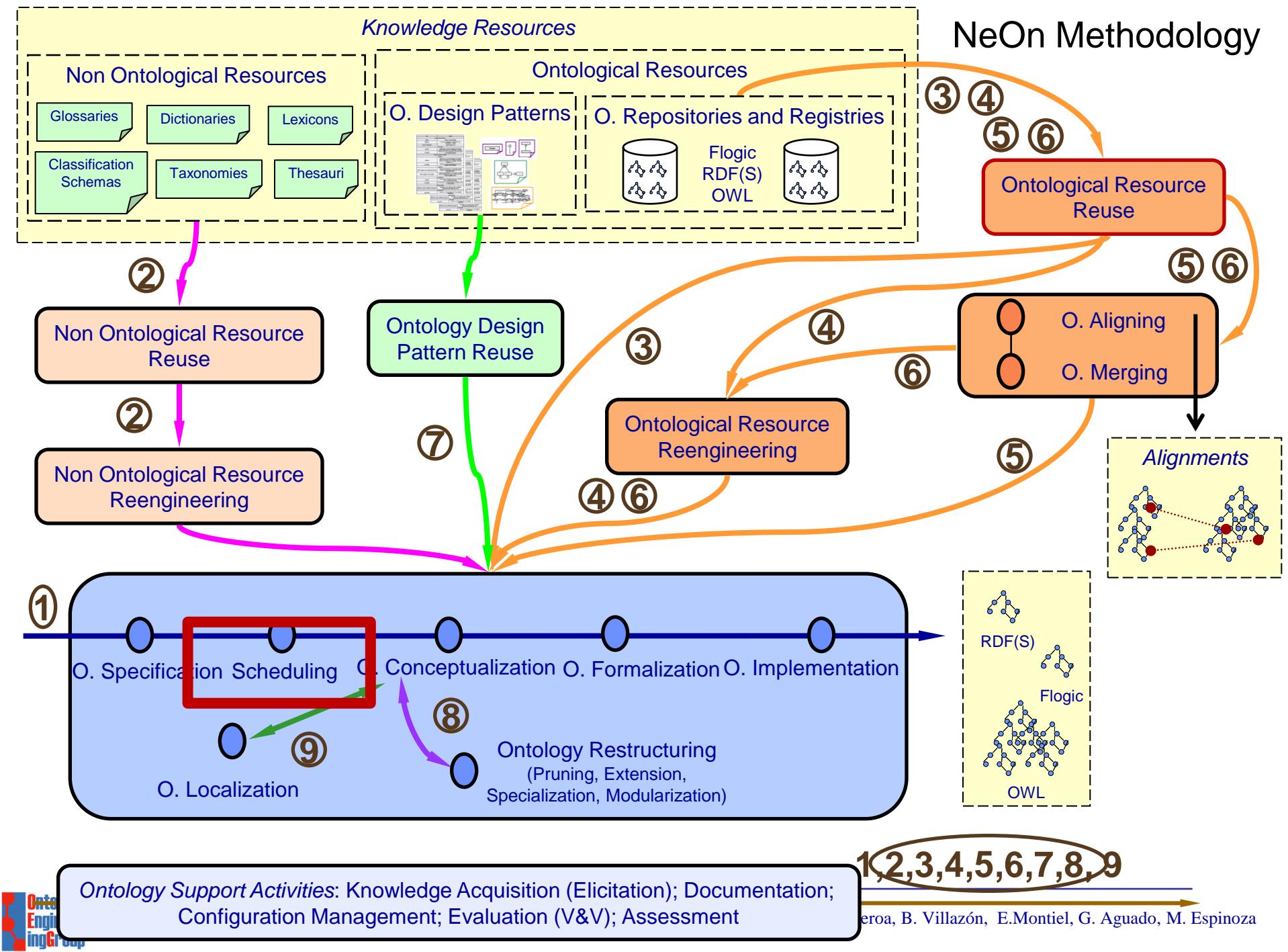
The screenshot shows a web browser window titled "Watson Semantic Web Search" with the URL <http://kmi-web05.open.ac.uk/WatsonWUI/>. A search bar at the top contains the query "smoking". Below the search bar, there is a portrait of a man and the text "Read this - Check your ontology - Website - Blog". A red arrow points from the "Job Category" section of the ontology requirement specification document to the search results page. The search results list 19 semantic documents, with the first few being:

- 1- <http://daml.umbc.edu/ontologies/cobra/0.4/academia> □
- 5 KB - RDF,OWL (OWL FULL) - ALCH(D)
 - <http://daml.umbc.edu/ontologies/cobra/0.4/academia#University> □
 - Label: University
 - Comment:
- 2- <http://annotation.semanticweb.org/ontologies/iswc.owl> □
- 30 KB - OWL,RDF (OWL Lite) - AL(D)
 - <http://annotation.semanticweb.org/2004/iswc#University> □
 - http://annotation.semanticweb.org/2004/iswc#University_of_Karlsruhe □
 - <http://annotation.semanticweb.org/2004/iswc#Researcher> □
 - <http://annotation.semanticweb.org/2004/iswc#GradStudentResearcher> □
 - Label: GradStudentResearcher
 - Comment:
- 3- <http://ontobroker.semanticweb.org/ontologies/ka2-onto-2000-11-07.daml> □
- 32 KB - DAML+OIL,RDF - AL(D)
 - <http://kmi-web05.open.ac.uk:81/cache/7f64e14aa3dd17/adbdb1ce20/2653b336ce35ba101#University> □
 - <http://kmi-web05.open.ac.uk:81/cache/7f64e14aa3dd17/adbdb1ce20/2653b336ce35ba101#Researcher> □
 - <http://kmi-web05.open.ac.uk:81/cache/7f64e14aa3dd17/adbdb1ce20/2653b336ce35ba101#Student> □
 - <http://kmi-web05.open.ac.uk:81/cache/7f64e14aa3dd17/adbdb1ce20/2653b336ce35ba101#PhDStudent> □
- 4- <http://www.ifi.unizh.ch/ddis/fileadmin/pdf/serviceBroker/swc.daml> □

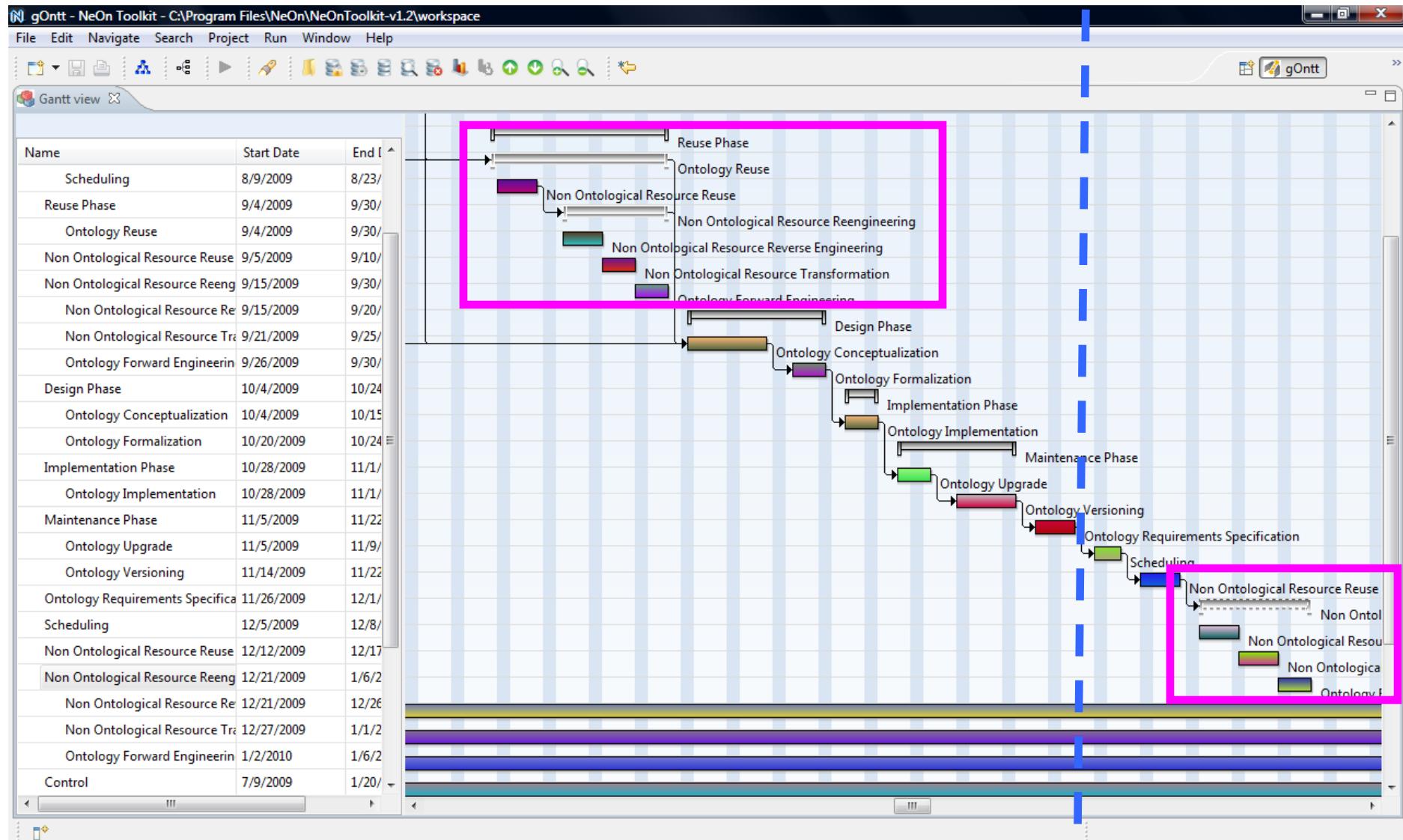
The NeOn methodology includes
guideliness for reusing statements



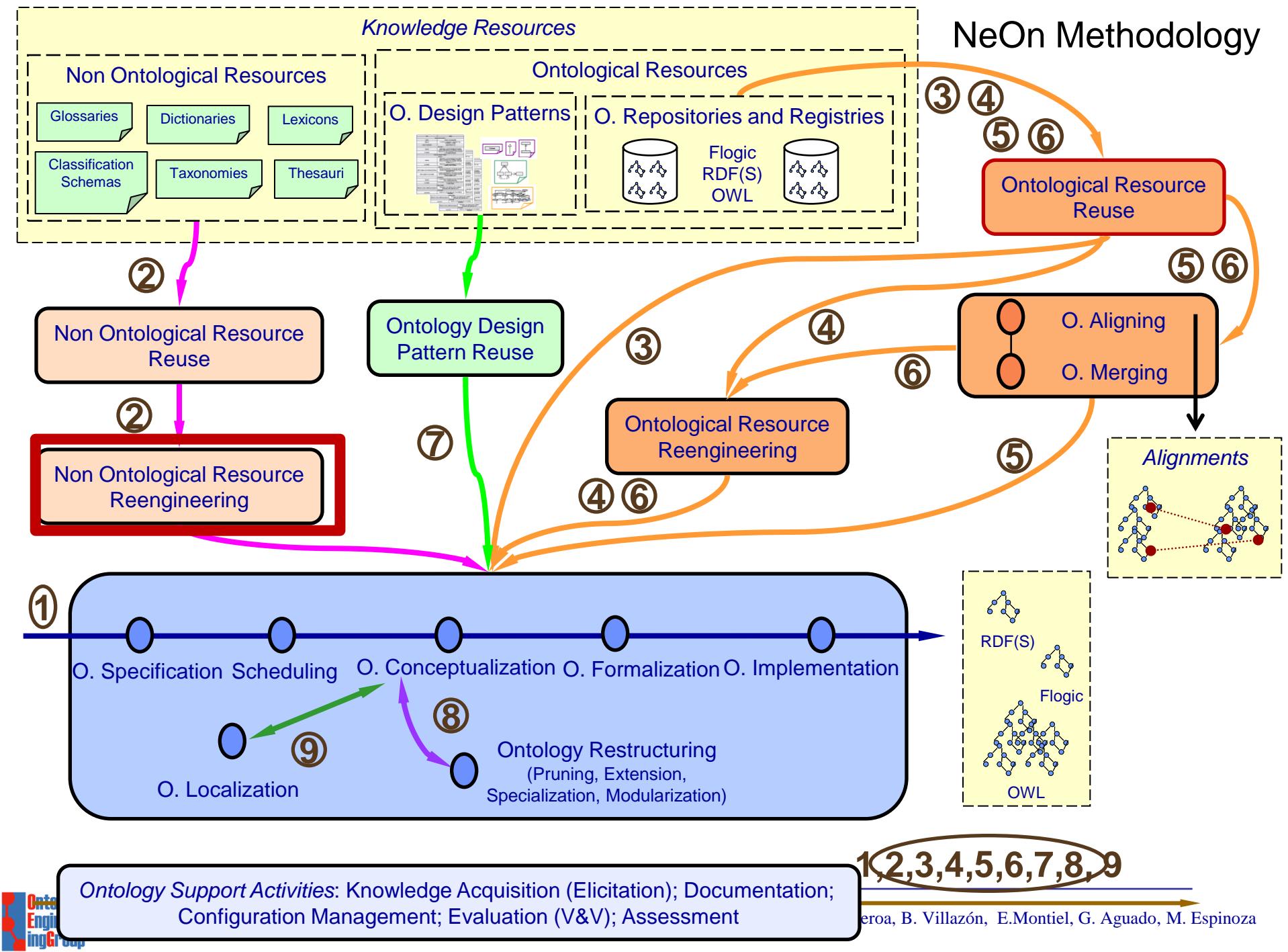
NeOn Methodology



Reuse and Re-engineering + Incremental



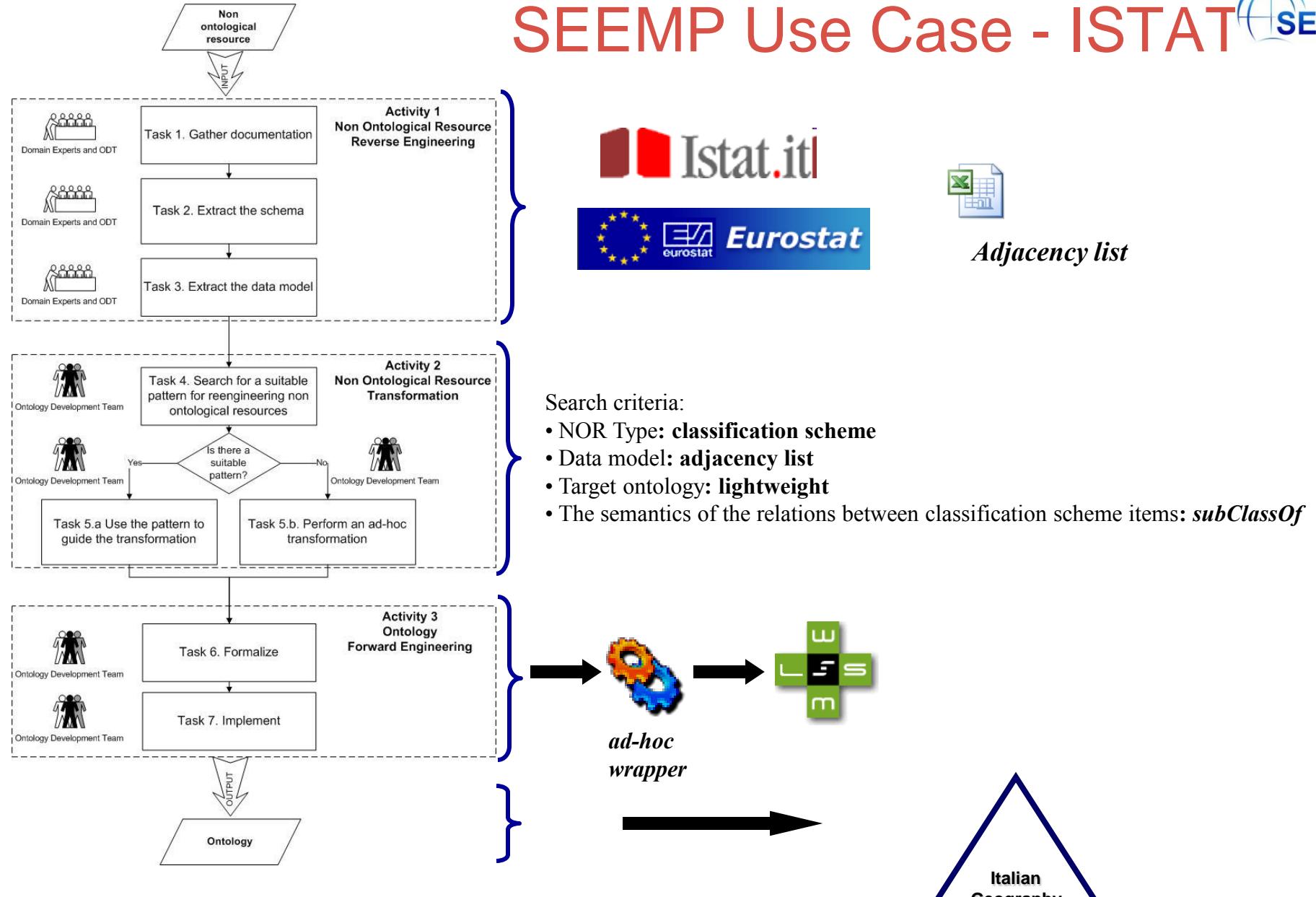
NeOn Methodology



SEEMP Use Case - ISTAT



SEEMP



Pattern based approach for re-engineering non ontological resources

ISCO-88 (COM)
International Standard Classification
of Occupations
(for European Union purposes)



FOET
Classification of fields of
education and training



NACE
Statistical Classification
of Economic Activities in the
European Community



ISO 3166
English country names
and code elements



ISTAT
Italian Geography
Standard



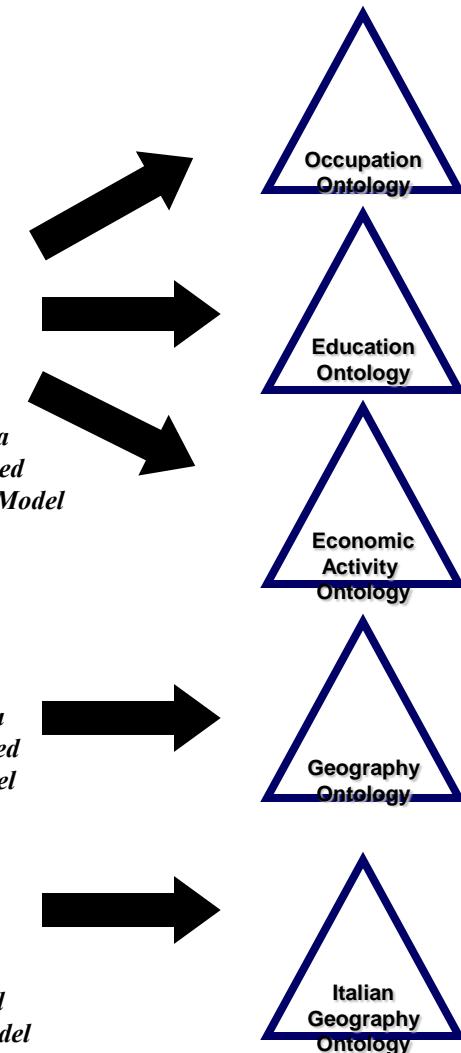
*Pattern for re-engineering a
classification scheme modelled
with a Path Enumeration Data Model*



*Pattern for re-engineering a
classification scheme modelled
with a Snowflake Data Model*



*Pattern for re-engineering a
classification scheme modelled
with an Adjacency List Data Model*



Reengineering and aggregating resources

EURES Taxonomy

(proprietary)

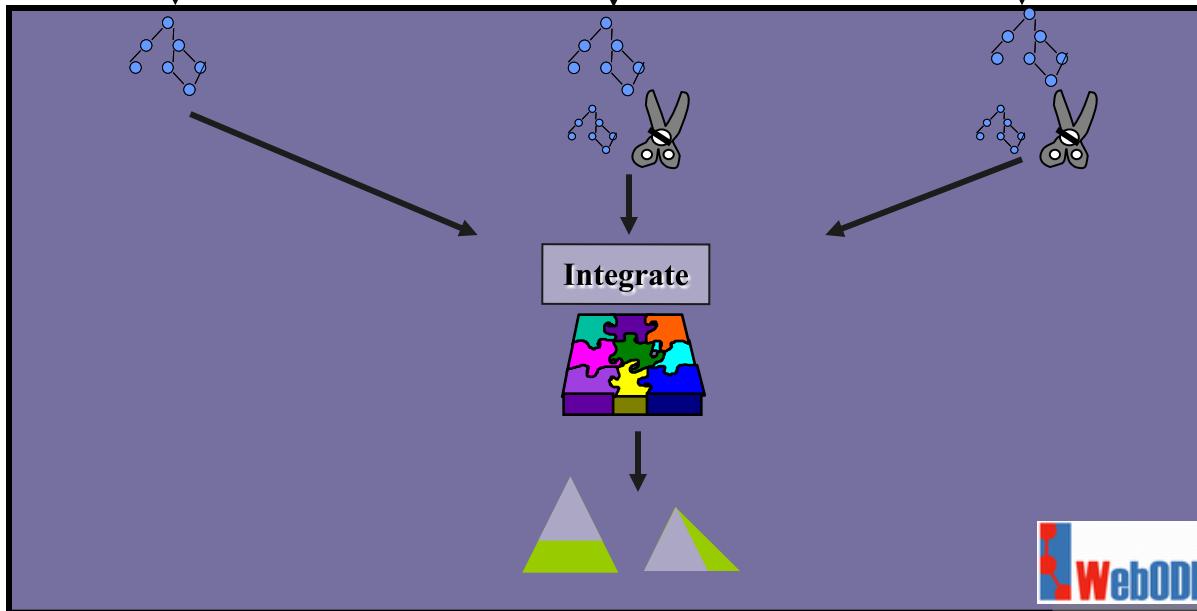
Oracle DB

ONET

HTML

ISCO-88 (COM)

MS Access



Knowledge Resource Re-engineering and Aggregation

ISO 3166-1 (XML)

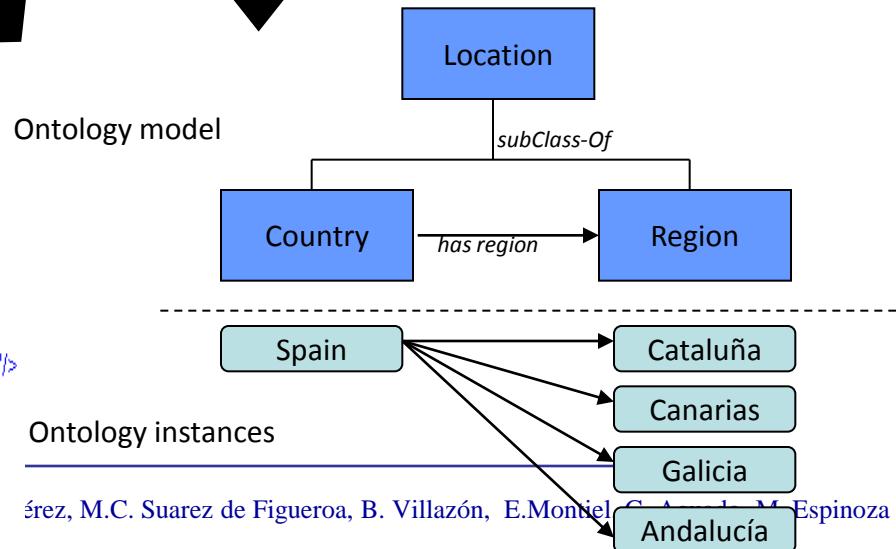
```
<ISO_3166-1_Entry>
  <ISO_3166-1_Country_name>SPAIN</ISO_3166-1_Country_name>
  <ISO_3166-1_Alpha-2_Code_element>ES</ISO_3166-1_Alpha-2_Code_element>
</ISO_3166-1_Entry>
```

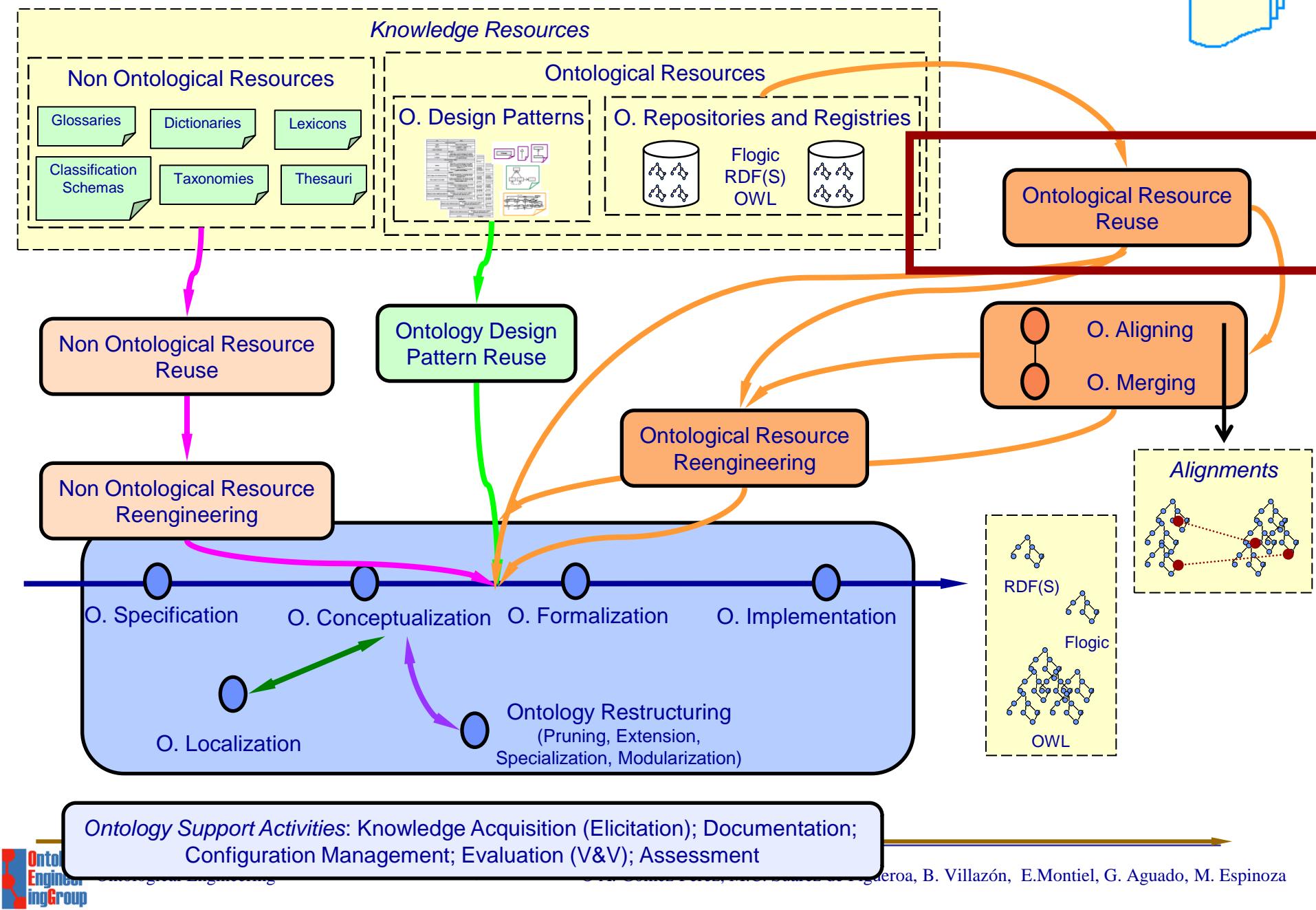
Excerpt of the Geography Ontology

```
<rdf:Description rdf:about="webode://mccarthy.dia.fi.upm.es/Geography_Ontology#Country_SPAIN">
  <rdf:type rdf:resource="webode://mccarthy.dia.fi.upm.es/Geography_Ontology#Country"/>
  <GeoOnt:Code rdf:datatype="http://www.w3.org/2001/XMLSchema#string">ES</GeoOnt:Code>
  <GeoOnt:Name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">SPAIN</GeoOnt:Name>
  <GeoOnt:is_located_in_Continent rdf:resource="webode://mccarthy.dia.fi.upm.es/Geography_Ontology#EU_Europe"/>
  <GeoOnt:has_region_Region rdf:resource="webode://mccarthy.dia.fi.upm.es/Geography_Ontology#Catalunya"/>
  <GeoOnt:has_region_Region rdf:resource="webode://mccarthy.dia.fi.upm.es/Geography_Ontology#Canarias"/>
  <GeoOnt:has_region_Region rdf:resource="webode://mccarthy.dia.fi.upm.es/Geography_Ontology#Galicia"/>
  <GeoOnt:has_region_Region rdf:resource="webode://mccarthy.dia.fi.upm.es/Geography_Ontology#Andalucia"/>
</rdf:Description>
```

Regions Table (Eures Oracle DB)

N	ISO31661 Code	Region
100	ES	Cataluña
101	ES	Canarias
102	ES	Galicia
103	ES	Andalucía
104	ES	Navarra
105	ES	Asturias
106	ES	Baleares
107	ES	Murcia
108	ES	Aragon

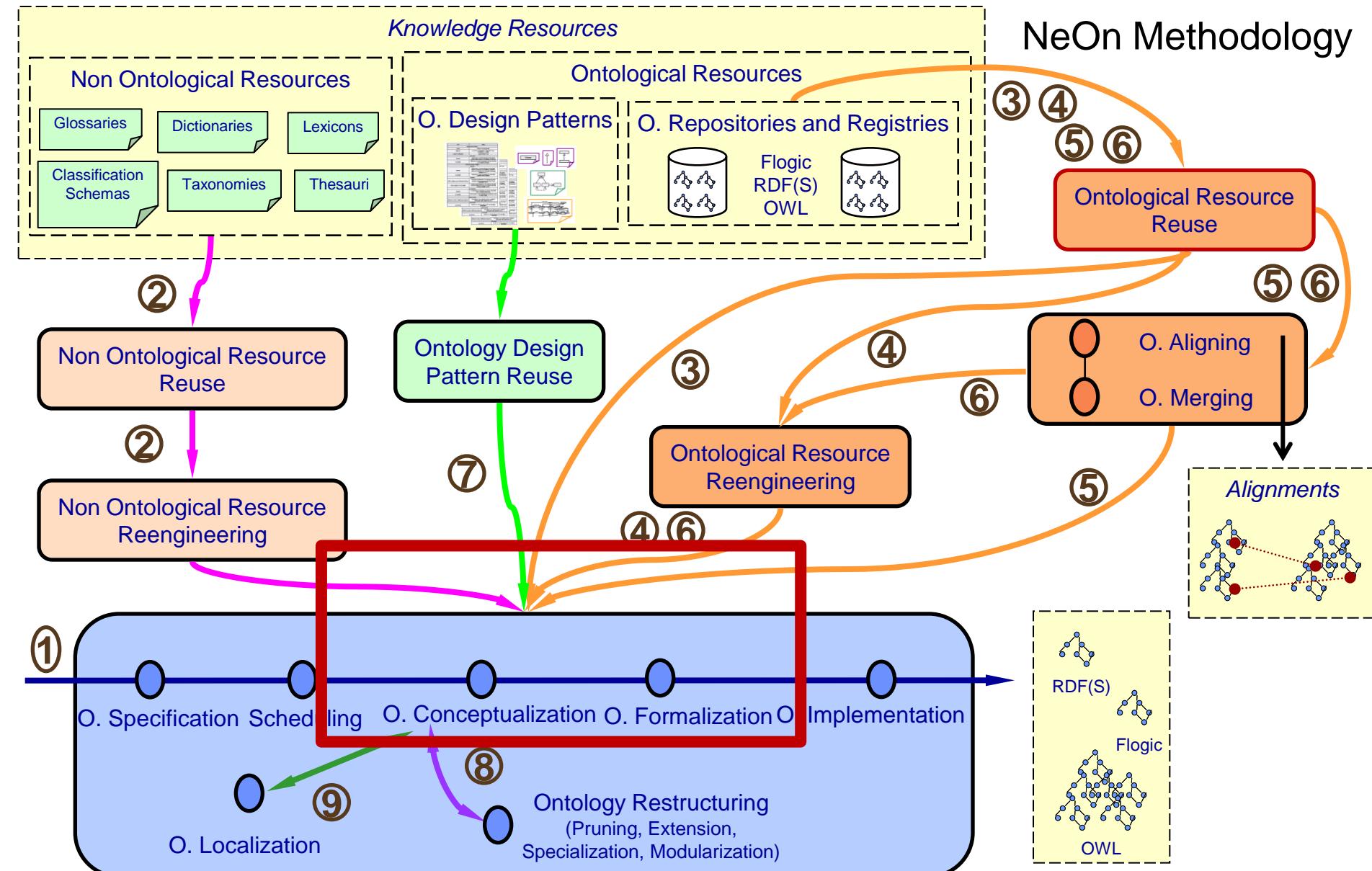




The Time Ontology Selection

	Cyc's Upper Ontology	Unrestricted Time Ontology	Simple Time Ontology	Reusable Time Ontology	Kestrel Time Ontology	SRI's Time Ontology	SUMO Time Ontology	DAML Time Ontology	AKT Time Ontology
Time Points	<input checked="" type="checkbox"/>								
Time Interval	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Absolute and Relative Time	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Relations between time intervals	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Convex and non convex intervals	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Distinction between open and close intervals	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Explicit modeling of proper intervals								<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Concatenation of intervals	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Different temporal granularities		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Provides axioms	<input checked="" type="checkbox"/>								

NeOn Methodology



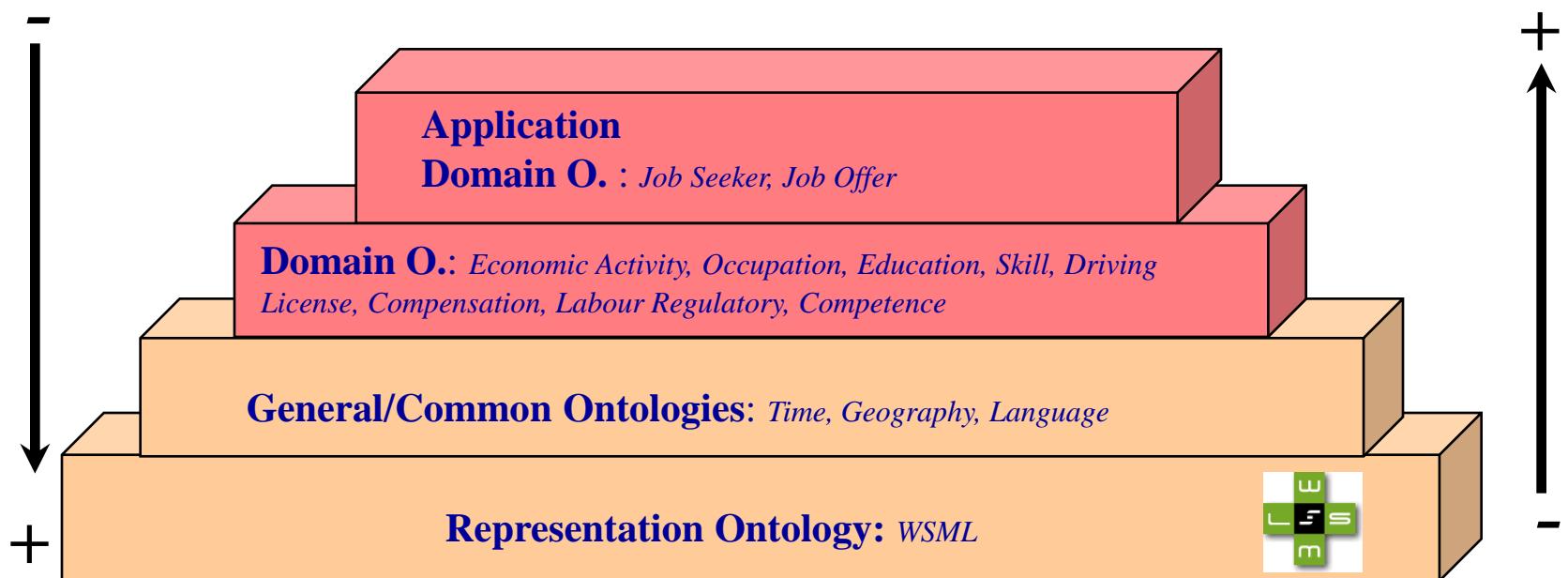
Ontology Support Activities: Knowledge Acquisition (Elicitation); Documentation; Configuration Management; Evaluation (V&V); Assessment

eroa, B. Villazón, E. Montiel, G. Aguado, M. Espinoza

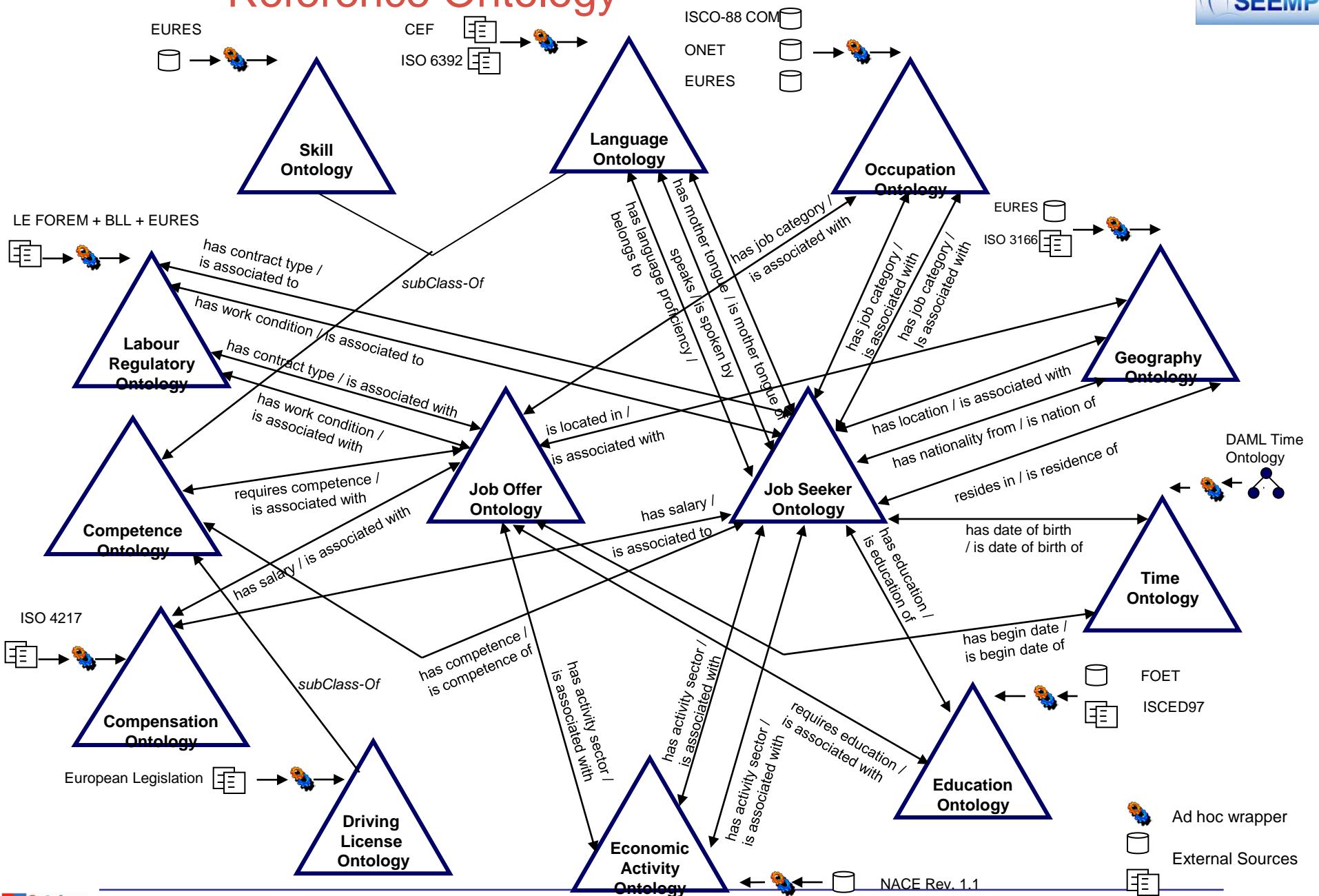
Conceptualization: Modular approach for ontology construction

Reusability

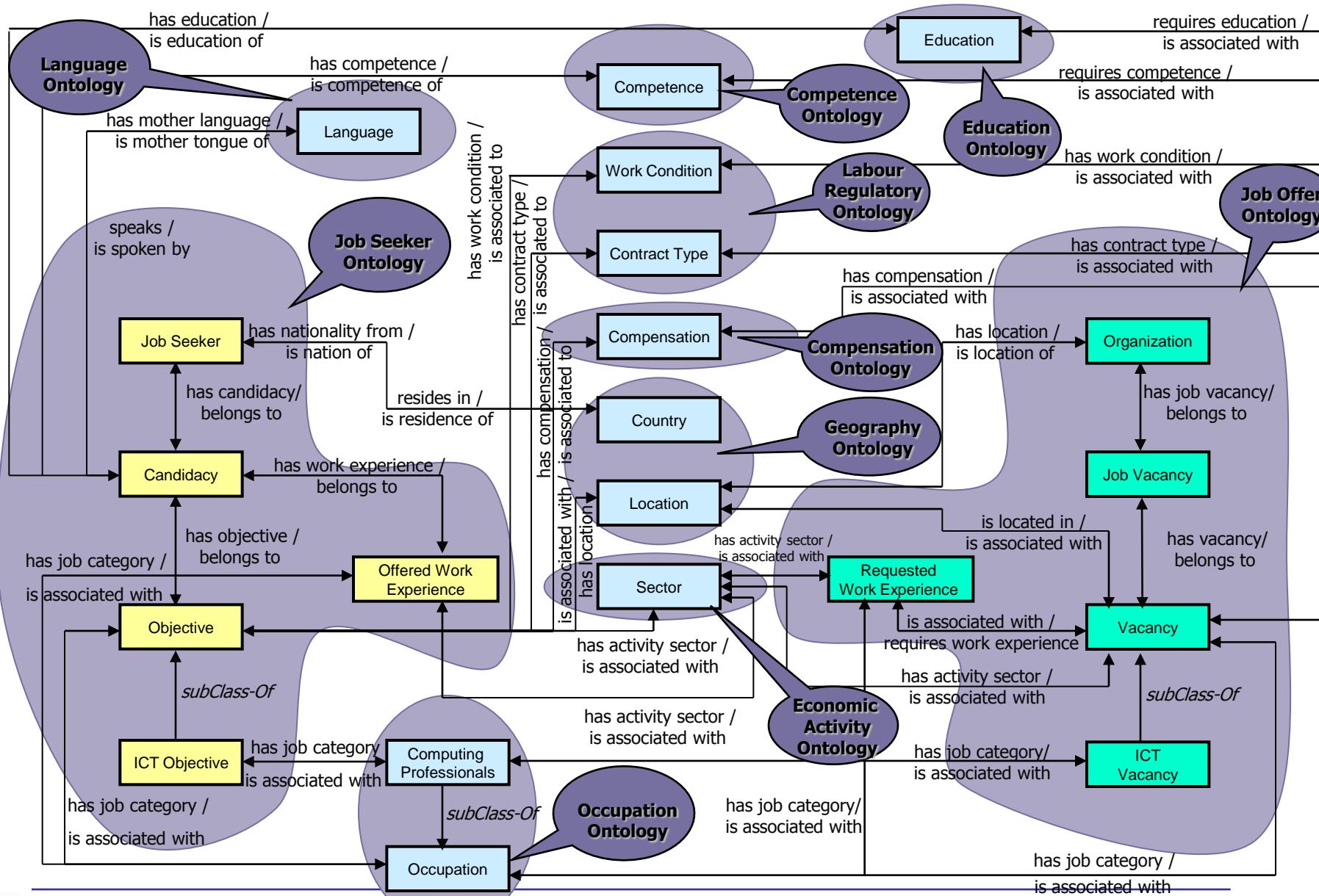
Usability



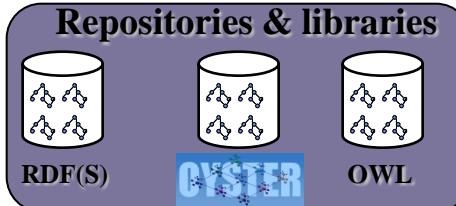
Reference Ontology



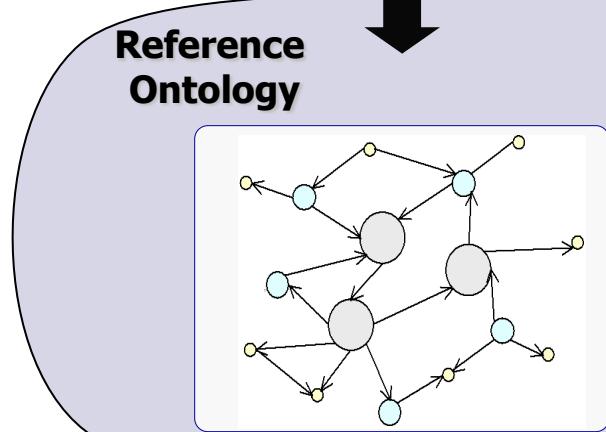
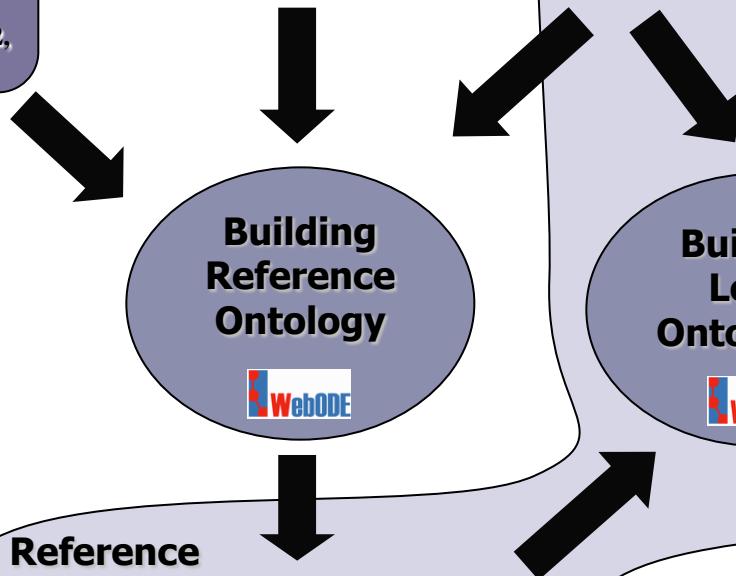
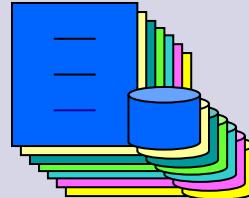
Details of the ontology



ISCO-88 (COM),
ONET,
EURES taxonomy,
FOET, ISCED97,
NACE, ISO 4217,
ISO 3166, ISO 6392,
HR-XML, ...

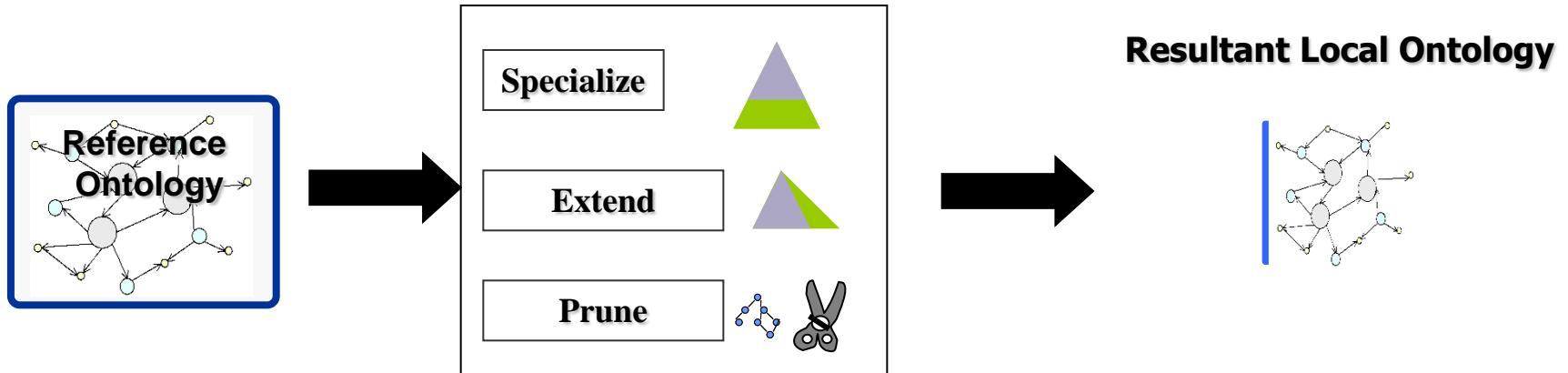


ES Data Sources



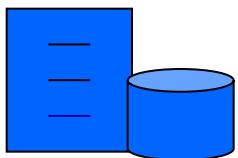
Local Ontologies Building Process

- Option 1: *Building Local Ontologies from the Reference Ontology.*



- Option 2: *Building Local Ontologies as a reverse engineering process from ES Data Sources.*

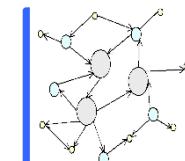
ES Data Sources



Reverse Engineering



Resultant Local Ontology



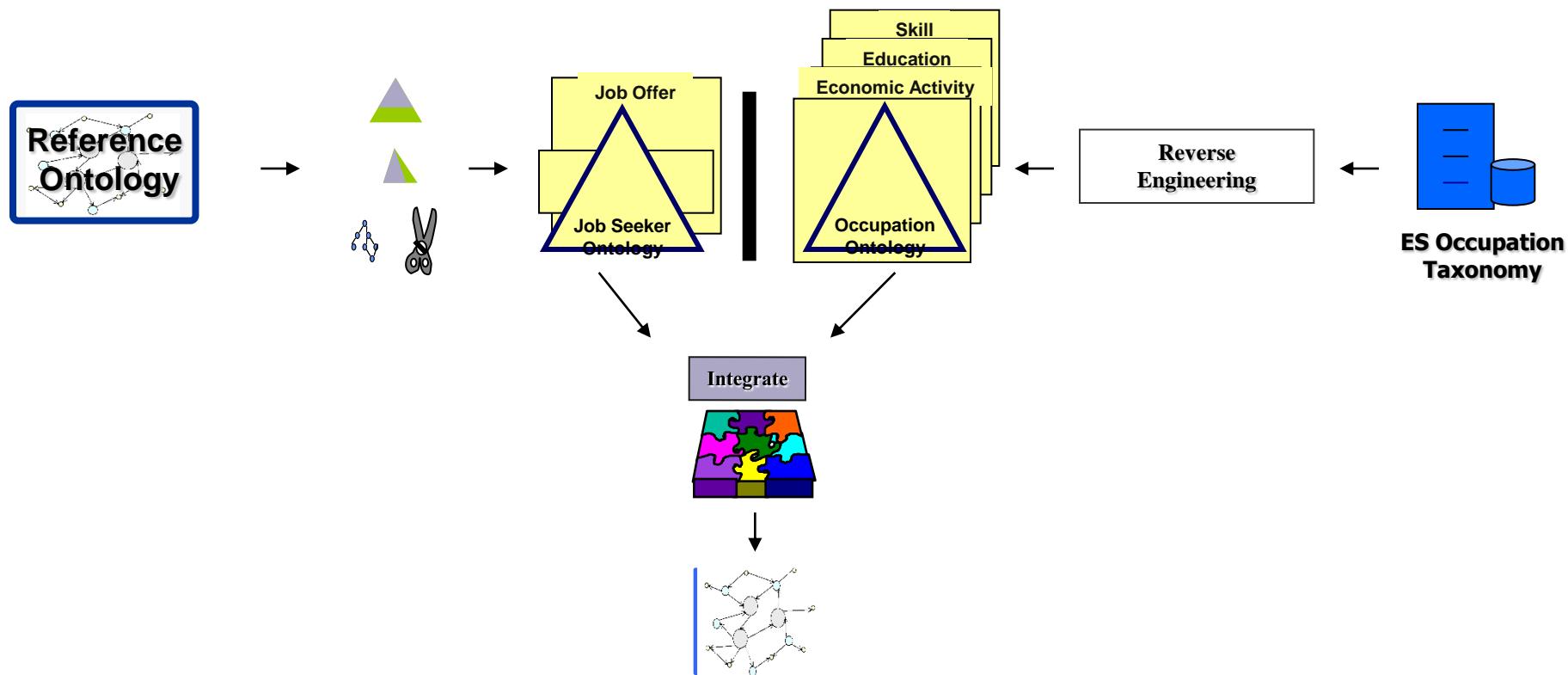
Which option is the most appropriate for the use

	Option 1: Building Local Ontologies from the Reference Ontology.	Option 2: Building Local Ontologies as a reverse engineering process from ES Data Sources.
Mappings between Local Ontologies and Reference Ontology	Mappings are not complex. They use the same terms.	Complex mappings due to terminology heterogeneity.
Mappings between Local Ontologies and ES schema sources	Complex mappings due to terminology and structural heterogeneity.	Mappings are not complex. They use the same terms.
Building process	Structured/guided by the architecture of the Reference Ontology and scoped with applications needs.	Requires more sophistication of knowledge engineering and good acquaintance of all the data and their structures of the application.
Changes in the Reference Ontology	Imply changes in <ul style="list-style-type: none"> - the mappings between local and reference ontologies. - the mappings between the local ontologies and the ES schema sources. - the Local Ontology. 	Imply changes in <ul style="list-style-type: none"> - the mappings between Local Ontologies and the Reference Ontology.
Changes in the ES schema sources	Imply changes in <ul style="list-style-type: none"> - its Local Ontology (probably the part that is not a mirror of the Reference Ontology). - the mappings between Local Ontologies and ES schema sources. - in the mappings between Local Ontology and the Reference Ontology. 	Imply changes in <ul style="list-style-type: none"> - the Local Ontologies. - in mappings between ES sources and Local Ontologies. - mappings between local and the Reference Ontology.

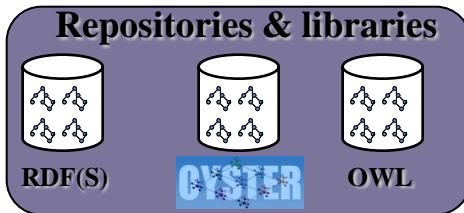
Approach followed by SEEMP for building Local Ontologies

A hybrid approach

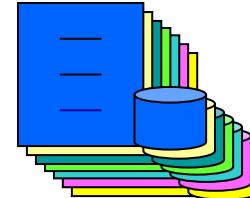
- Option 1 for Job Seeker and Job Offer Ontologies
- Option 2 for Occupation, Education, etc.



ISCO-88 (COM),
ONET,
EURES taxonomy,
FOET, ISCED97,
NACE, ISO 4217,
ISO 3166, ISO 6392,
HR-XML, ...



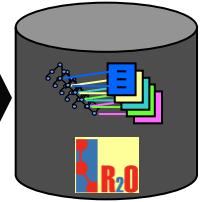
ES Data Sources



Building Mappings L.O. - ES Data Sources



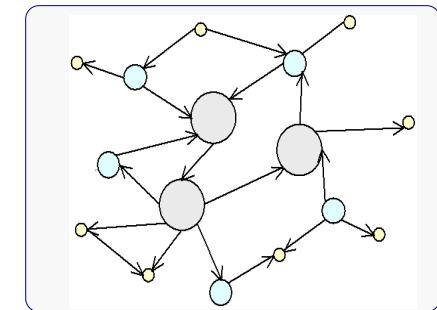
Mappings L.O. - ES Data Sources



Building Reference Ontology



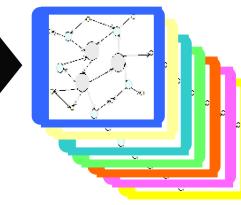
Reference Ontology



Building Local Ontologies



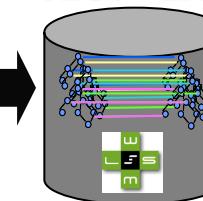
Local Ontologies



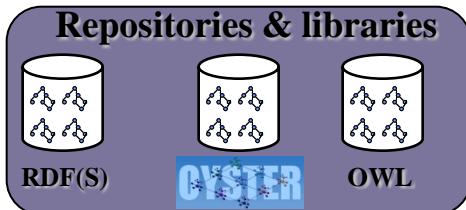
Building Mappings R.O. - L.O.



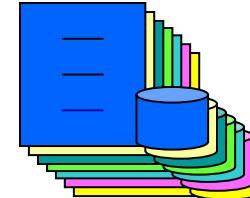
Mappings R.O. - L.O.



ISCO-88 (COM),
ONET,
EURES taxonomy,
FOET, ISCED97,
NACE, ISO 4217,
ISO 3166, ISO 6392,
HR-XML, ...



ES Data Sources

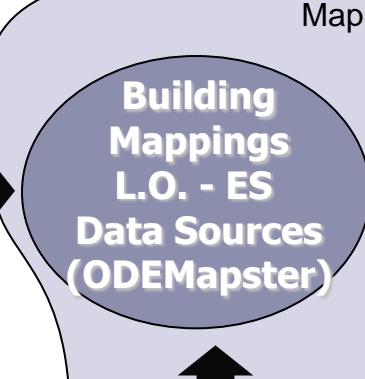
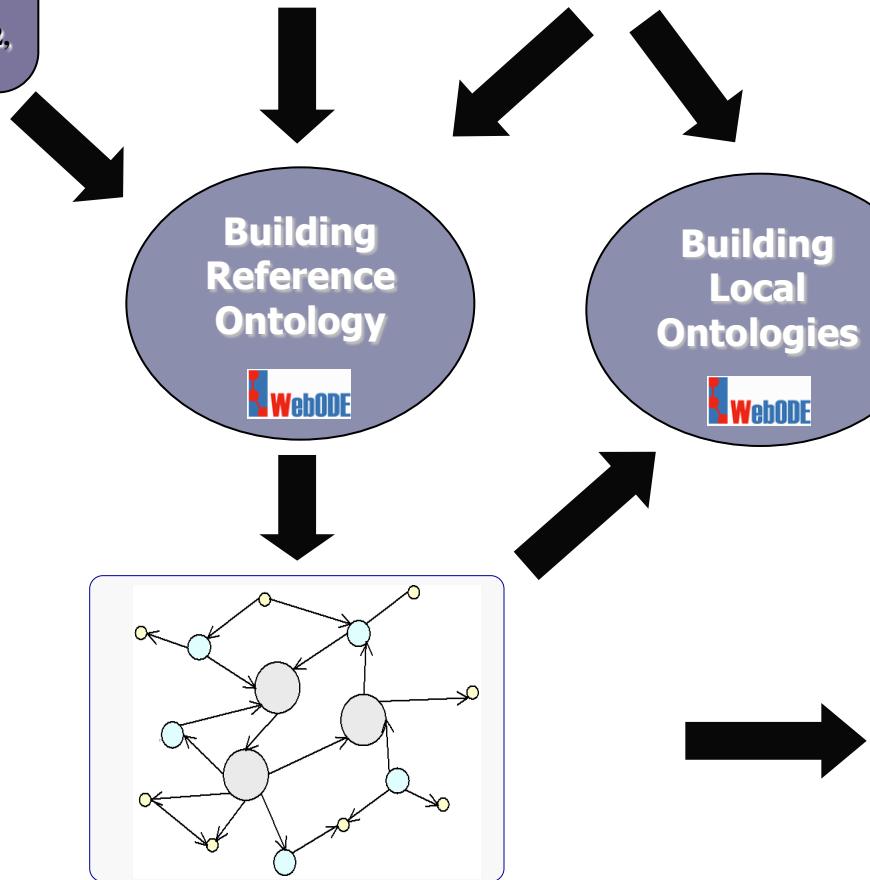


Building Mappings L.O. - ES Data Sources (ODEMapster)

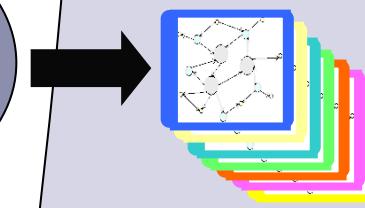
ODEMapster
Mapping Editor

Mappings ES-LO

R₂O
Mappings

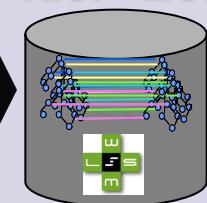


Local Ontologies

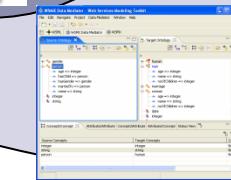


Building Mappings R.O. - L.O.

Mappings R.O. - L.O.



WSMT



Conclusions

1. **The NeOn methodology facilitates the reuse and reengineering of non ontological resources into ontologies**
2. The reuse of non-ontological resources that have been reached some degree of consensus in a community allows the development of ontologies easier and quicker
3. The use of external resources for disambiguating the semantics of the relations in the resource, the resultant ontology will have better quality degree.

NeOn Methodology Pointers

- ❑ Scenarios for Building Ontology Networks → **D5.3.1 and D5.4.2**
- ❑ NeOn Glossary of Processes and Activities → **D5.3.1 and D5.3.2**
- ❑ Set of Ontology Network Life Cycle Models → **D5.3.2**
- ❑ Methodological Guidelines for Ontology Requirements Specification → **D5.4.1**
- ❑ Methodological Guidelines for Scheduling and gOntt plug-in → **D5.3.2**
- ❑ Methodological Guidelines for Non-Ontological Resource Reuse and Reengineering → **D5.4.1 and D2.2.2**
- ❑ Methodological Guidelines for Ontological Resource Reuse → **D5.4.1**
- ❑ Methodological Guidelines for ODP Reuse → **D5.4.1 and D5.4.2**
- ❑ Methodological Guidelines for Ontology Modularization → **D5.4.2**
- ❑ Methodological Guidelines for Ontology Evaluation → **D5.4.2**
- ❑ Methodological Guidelines for Ontology Evolution → **D5.4.2**
- ❑ Methodological Guidelines for Ontology Localization → **D5.4.2**