Scenarios for Building Ontology Networks

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Introduction

The development of ontologies in different projects has revealed that there are different ways to build ontologies. For example, in the Esperonto project, ontologies were built from scratch using METHONTOLOGY; in Knowledge Web, the aligning and versioning of ontologies was treated as well as the use of patterns; and in the SEEMP project, a good requirements specification helped to find consensual knowledge resources that were re-engineered into ontologies, just to name a few.

METHONTOLOGY, On-To-Knowledge, and DILIGENT have gone a step forward in transforming the art of constructing single ontologies into an engineering activity.

However, up to date, there are no methodologies that help ontology developers to build large ontologies in different ways. Such ways can involved the reuse and possible re-engineering of knowledge resources, the use of alignments, the continuous evolution of the ontologies, and the use of ontologies embedded in ontology networks built collaboratively by teams.

	METHONTOLOGY	On-To-Knowledge	DILIGENT
NeOn Dimensions			
Collaboration	Not mentioned	Not mentioned	Treated
Context	Not mentioned	Not mentioned	Not mentioned
Dynamic	Mentioned, but not treated	Mentioned, but not treated	Mentioned, but not treated
Reuse as Collaboration: Detailed Guidelines			
Reusing and Re-engineering Non-ontological Resources	Not provided, neither explicitly mentioned	Not provided, neither explicitly mentioned	Not provided, neither explicitly mentioned
Reusing Ontological Resources	Not provided Only a list of activities to be carried out is proposed	Includes recommendations for identifying ontologies to be reused	Not provided, neither explicitly mentioned
Reusing Ontology Design Patterns	Not provided, neither explicitly mentioned	Not provided, neither explicitly mentioned	Not provided, neither explicitly mentioned

NeOn Methodology for Building Ontology Networks

We have created the NeOn Methodology for building ontology networks, a scenario-based methodology. The key assets of the NeOn Methodology are

- **a set of nine scenarios for building ontologies and ontology networks**, emphasizing the reuse of ontological and non-ontological resources, generalizing from previous experiences, covering the drawbacks of the existing methodologies, and taking into account collaboration and dynamism.
- The NeOn Glossary of Processes and Activities (Chapter 3)
- All processes and activities are described with (a) a filling card, (b) a workflow, and (c) examples.

Ontology Networks developed with the NeOn Methodology

Apart of the ontologies being developed in the NeOn project for the different use cases (NeOn Invoicing Management use case and NeOn Semantic Nomenclator use case), the methodology is being used for building other ontologies in the framework of the following projects: ontologies about The Way of St. James in Geobuddies; context ontologies in miO!; human resource ontologies in SEEMP; IPR ontologies in Autores 3.0; ontologies about “patient safety” (“Falls” and “Pressure Ulcer” subdomains) in the International Classification for Patient Safety Project (ICPS) for the World Health Organization (WHO); and multimedia ontologies in BuscaMedia.

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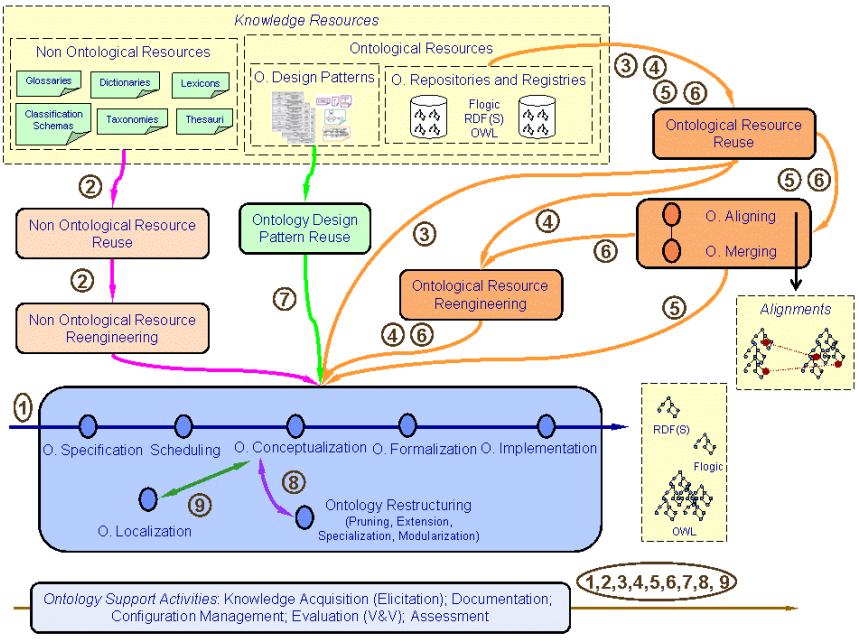
Scenarios for Building Ontology Networks in the NeOn Methodology

Scenario 1: From specification to implementation. The ontology network is developed from scratch (without reusing existing resources). Developers should specify ontology requirements (Chapter 5). After that, it is advisory to carry out a search for potential resources to be reused. Then, the scheduling activity must be performed (Chapter 7), and developers should follow the plan.



Scenario 2: Reusing and re-engineering non-ontological resources (NORs). Developers should carry out the NOR reuse process for deciding, according to the ontology requirements, which NORs can be reused to build the ontology network. Then, the selected NORs should be re-engineered into ontologies. Guidelines are provided in Chapter 8.

Scenario 3: Reusing ontological resources. Developers use ontological resources (ontologies as a whole (Chapter 9 and 10), ontology modules, and/or ontology statements (Chapter 11)) to build ontology networks.

Scenario 4: Reusing and re-engineering ontological resources. Ontology developers reuse and re-engineer ontological resources.

Scenario 5: Reusing and merging ontological resources. This scenario arises when several ontological resources in the same domain are selected for reuse, and developers wish to create a new ontological resource with the selected resources. Related guidelines are provided in Chapter 18.

Scenario 6: Reusing, merging and re-engineering ontological resources. Ontology developers reuse, merge, and re-engineer ontological resources. This scenario is similar to Scenario 5, but here developers decide to re-engineer the set of merged resources.

Scenario 7: Reusing ontology design patterns (ODPs). Ontology developers access repositories to reuse ODPs (Chapter 12).

Scenario 8: Restructuring ontological resources. Ontology developers restructure (e.g., modularize, prune, extend, and/or specialize) ontological resources to be integrated in the ontology network. Guidelines for modularizing are provided in Chapter 15.

Scenario 9: Localizing ontological resources. Ontology developers adapt an ontology to other languages and culture communities, thus obtaining a multilingual ontology. Guidelines for this scenario are provided in Chapter 13.

Additional information:

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- *NeOn Deliverable D5.3.1 (http://www.neon-project.org/web-content/images/Publications/neon_2007_d5.3.1.pdf)*
- *NeOn Deliverable D5.3.2 (http://www.neon-project.org/web-content/images/Publications/neon_2009_d5.3.2.pdf)*
- *S3T'09 Paper: "NeOn Methodology for Building Ontology Networks: a Scenario-based Methodology". Mari Carmen Suárez-Figueroa, Asunción Gómez-Pérez.*
- *KCAP'09 Poster: "Scenarios for Building Ontology Networks within the NeOn Methodology". Asuncion Gomez-Perez and Mari Carmen Suarez-Figueroa.*