

# MOKi

the Modelling Wiki ---

or ... how to support collaborative Knowledge Engineering  
via Semantic MediaWiki

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# Motivations

- Building high quality (formal) models of an enterprise is a strategic task:
  - improve knowledge management
  - provide knowledge-based services
  - reasoning and verification
  - ....
- It is a task we have to accomplish more and more in research and technology transfer projects.

# An example: The APOSDLE project

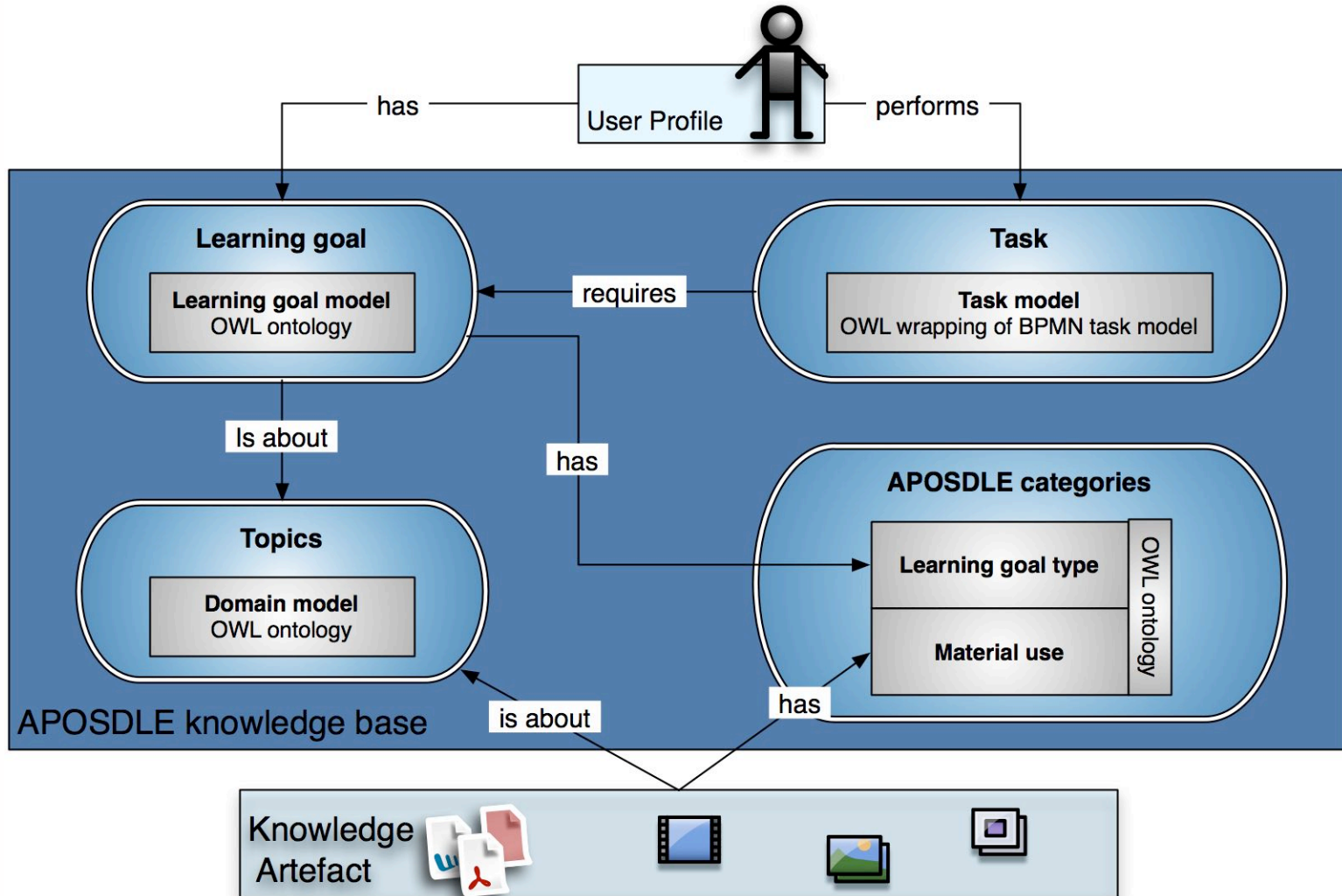


APOSDLE aims at developing a software platform to support the process of learning@work, that is learning within the context of the immediate work of a user and within his/her current work environment.

Website: [www.aposedle.org](http://www.aposedle.org)

APOSDLE is a 48 months research and development integrated project partially supported by the European Community under the Information Society Technologies (IST) priority of the 6th framework programme for R&D (contract no. IST-027023).

# The enterprise model (in APOSDLE)



# Enterprise Modelling

- Modelling the relevant aspects of an enterprise
  - **Static aspects** (e.g. the organizational structure, the products, the documents, ...)
    - domain model
  - **Dynamic aspects** (e.g, the procedures, the activities...)
    - process model
- Domain and Process model need to be **integrated**.

# Building the enterprise model

But.....

- Models cannot be completely extracted from data;
- Knowledge is owned by “experts”.

Modeling is a complex activity which requires the collaboration between:

- Knowledge **experts**;
- Knowledge **engineers**.

# Specific Problems

- Different types of formal models (and tools to produce them);
- Complex Modeling team:
  - Different knowledge engineering skills;
  - Several domain/task/competencies/... experts;
  - Different locations (rare face-to-face meetings);
  - Different organisations (e.g, SMEs do not have knowledge engineering skilled people)
- Tools designed for knowledge engineers (Protégé, YAWL editor)
  - Experts write unstructured descriptions (or, Excel files);
- Little support for agile and interleaved collaboration between all actors
  - Descriptions and models are often contained in documents which are emailed back and forth

# Our Contribution

Relevant aspects

Domain  
model

Process  
model

Knowledge expert  
(informal knowledge)

**MOKi**

the Modelling WiKi ---

Knowledge engineer  
(formal knowledge)

Main actors



# MoKi; the Modeling Wiki

- A new tool for enterprise modelling based on two pillars:
  1. Semantic MediaWiki as a **uniform layer** for modelling domain and processes;
  2. Tight integration between **informal** and **formal** modelling to support knowledge experts and knowledge engineers.

# MoKi basic technology

- Built on top of Semantic MediaWiki.
  - Supports collaborative editing;
  - Only a web-browser is required on the client side;
  - Users are quite familiar with wikis;
  - Basic versioning facilities;
  - Semantic information provided in the wiki helps to structure knowledge and to automatically extract formal models.

# Ideas behind MoKi

- One “item” = one wiki page;
- Overview pages;
- Templates to guide informal but structured descriptions;
- Import/export of formal models;
- Provide some validation of knowledge;
- Insert/reuse existing techniques / tools for modelling

# One item = one page

## Domain model

- **Concept Page**
- **Individual page**
- **Property Page**

## Process model

- **Process Page**

# Concept Page

The screenshot shows a web browser window displaying the MoKi (The Modelling Wiki) interface. The page title is "Conference - MoKi (The Modelling Wiki) - Version 1.0". The URL is "https://moki.fbk.eu/moki/tryitout/index.php/Conference". The page features a navigation bar with tabs for "page", "discussion", "edit with form", "history", "delete", "move", "watch", and "refresh". The main content area is titled "Conference" and includes a description, synonyms, and a table of properties. The left sidebar contains various utility sections: "Import/Export", "Edit", "List", "Visualise", "Validate", and "Navigation".

**Moki**  
the Modelling Wiki

**Import/Export**  
Import Functionalities  
Export Functionalities

**Edit**  
Add/Edit a Concept  
Add/Edit an Individual  
Add/Edit a Property  
Add/Edit a Process

**List**  
List Concepts  
List Individuals  
List Properties  
List Processes

**Visualise**  
IsA Browser  
IsPartOf Browser  
Individuals Browser

**Validate**  
Ontology Checklist  
Individuals Checklist

**Navigation**

**Conference**

**Description:** A conference is a formal meeting that typically takes place over a number of days and involves people with a shared interest, esp. one held regularly by an association or organization

**Synonyms:** congress, meeting, convention, seminar, colloquium, symposium, forum

Conference	
Completeness	<div style="width: 100%; height: 10px; background-color: green;"></div>
Sharedness	<div style="width: 20%; height: 10px; background-color: red;"></div>

**Conference is a:** [Event](#)

**Conference is part of:**

**Conference** ----( [participant](#) )----> [Person](#)

**Subconcepts of Conference:** [InternationalConference](#)

**Conference has no parts**

**Individuals of Conference:** [ISWC2009](#)

Category: [Domain model](#)

## Domain model

- [Concept Page](#)
- [Individual page](#)
- [Property Page](#)

# Process page

Write a paper – MoKi (The Modelling Wiki) – Version 1.0

https://moki.fbk.eu/moki/tryitout/index.php/Write\_a\_paper

Facebook | Home Write a paper – MoKi (The Modelli... BBC News – Copenhagen police b...

page discussion edit with form history delete move watch refresh

## Write a paper

Export to eRDF format (for Oryx) Only this process | Sub processes in separate file(Zip Archive) | Sub processes in same file as embedded design

**Import/Export**  
Import Functionalities  
Export Functionalities

**Edit**  
Add/Edit a Concept  
Add/Edit an Individual  
Add/Edit a Property  
Add/Edit a Process

**List**  
List Concepts  
List Individuals  
List Properties  
List Processes

**Visualise**  
IsA Browser  
IsPartOf Browser  
Individuals Browser

**Validate**  
Ontology Checklist  
Individuals Checklist

**Navigation**  
Main Page  
Recent changes

search  
Go Search

```
graph LR; Start(( )) --> A[Define paper's topic]; A --> B[Review state of the art]; B --> C[Organize the original part]; C --> D[Revise and rewrite]; D --> E[Submit paper to a Journal]; D --> F[Submit paper to a conference]; D --> G[Submit paper as a technical report]; E --> End((( )))
```

**Description:** The process of writing a scientific paper

**Required concept:** Publication, ResearchTopic, Event, Person

Category: Process model

Process model

- Process Page

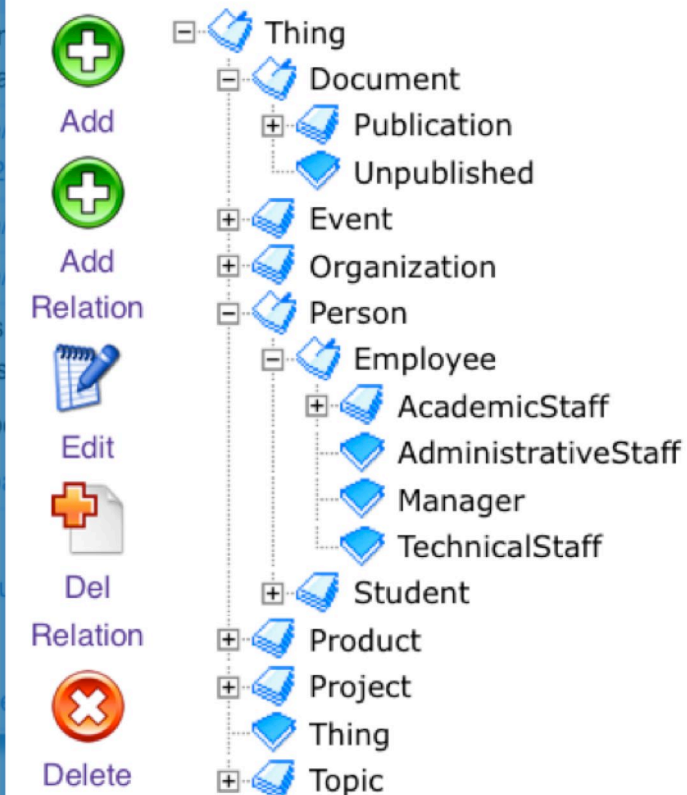
# Overview Pages

## List domain concepts

Number of concepts in the Domain Model: 71

☒ Concept	Description
Misc	Work of another or undetermined the scheme is not explicitly stated
UndergraduateIntermediateClass	see: <a href="http://www.neurolabor.de/cgi-bin/dict/urlexp/200307052">http://www.neurolabor.de/cgi-bin/dict/urlexp/200307052</a>
UndergraduateAdvancedClass	see: <a href="http://www.neurolabor.de">http://www.neurolabor.de</a>
GraduateClass	see: <a href="http://www.neurolabor.de">http://www.neurolabor.de</a>
Topic	If changing this concept (or its ontology) depends on the forecast The swrc topic ontology can be found at <a href="http://ontoware.org/frs/download.php/1000/swrc-topics.owl">http://ontoware.org/frs/download.php/1000/swrc-topics.owl</a>
Document	Dublin Core elements added. See: <a href="http://dublincore.org/documents/">http://dublincore.org/documents/</a> for document types see: <a href="http://www.bsz-bw.de/diglib/m">http://www.bsz-bw.de/diglib/m</a>

## Domain Model: Is\_a Browser



☒ Is  
part of

# Editing templates via forms

The screenshot shows a web browser window titled "Modify Concept: Conference - MoKi (The Modelling Wiki) - Version 1.0". The address bar shows the URL "https://moki.fbk.eu/moki/tryitout/index.php?title=Conference&action=fr". The page has a navigation bar with tabs for "page", "discussion", "edit with form", "history", "delete", "move", "watch", and "refresh". The main content area is titled "Modify Concept: Conference" and contains several form sections:

- Annotations:** A text area for "Description" containing the text: "A conference is a formal meeting that typically takes place over a number of days and involves people with a shared interest, esp. one held regularly by an association or organization".
- Synonyms:** A text input field containing "congress, meeting, convention, seminar, colloquium, symposium, forum".
- Hierarchical Structure:** Two input fields: "Conference is a:" with "Event" entered, and "Conference is part of:" which is empty.
- Properties:** A table with columns "Subject", "Property", and "Object(s)". The first row shows "Conference" as the subject, "participant" as the property, and "Person" as the object. Below the table are "Remove" and "Add another" buttons.
- Notes (free text):** A large text area for notes, currently empty.
- Form Controls:** At the bottom, there are checkboxes for "This is a minor edit" and "Watch this page", and buttons for "Save page", "Show preview", "Show changes", and "Cancel".

The left sidebar contains various navigation and utility links, including "Import/Export", "Edit", "List", "Visualise", "Validate", "Navigation", "search", and "toolbox".

Appropriate  
templates for the  
different entities



# Moki functionalities

The screenshot shows the Moki website interface with several callouts pointing to specific features:

- Import/export in OWL and BPMN** and **Term Extraction facilities**: Callout pointing to the **Import/Export** menu.
- Edit a single item**: Callout pointing to the **Edit** menu.
- List browsers**: Callout pointing to the **List** menu.
- Graphical browsers**: Callout pointing to the **Visualise** menu.
- Validation Scripts and check list**: Callout pointing to the **Validate** menu.

The website content includes sections for **Getting started** (with links to the User Manual and Web-site) and **Login Details** (with login information for User: Moki).

Navigation and search options are visible at the bottom, including a search bar and links for **Previous**, **Next**, **Highlight all**, and **Match case**.














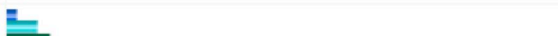



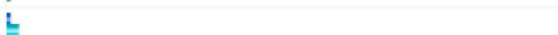

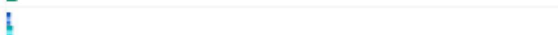

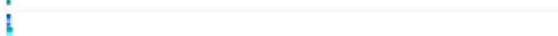

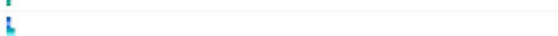

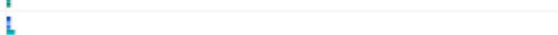

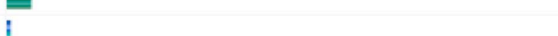

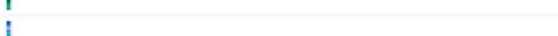

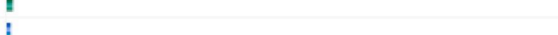

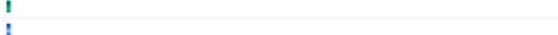





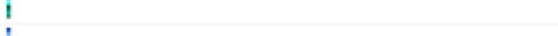

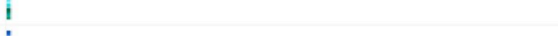
# MoKi @ work

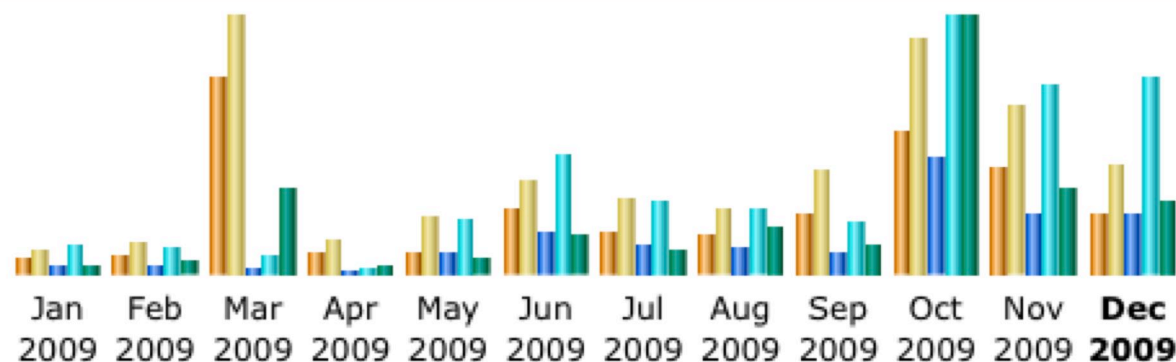
- Six medium-size **enterprise models** for the use cases in APOSDLE (FP6 EU-project (2008))
- Training in **knowledge management courses** at
  - university of Graz (6 MoKi's ~ 50 users each)
  - University and Bratislava
- **Revision** of an Organic Agriculture and Agroecology ontology (FP7 Organic.Edunet project)
- Experiments at CEII Trentino

## Sister tools:

- Collection of italian medical **lay terminology** (oct 2008)
- Specification of **medical guidelines** (output in ASBRU)

# Usage of the on-line version

Countries						az
	Countries		Pages	Hits	Bandwidth	
	Italy	it	6505	16574	493.44 MB	
	European country	eu	5435	15456	338.00 MB	
	United States	us	1443	3765	91.88 MB	
	Austria	at	601	1519	109.10 MB	
	Germany	de	562	1191	29.71 MB	
	Slovak Republic	sk	378	933	14.05 MB	
	Spain	es	261	897	38.90 MB	
	Portugal	pt	95	199	2.76 MB	
	Great Britain	gb	94	319	8.25 MB	
	Greece	gr	81	136	1.01 MB	
	Norway	no	76	144	3.51 MB	
	Japan	jp	58	197	2.57 MB	
	Sweden	se	52	215	21.66 MB	
	Hungary	hu	44	76	1.24 MB	
	France	fr	30	55	4.80 MB	
	China	cn	18	35	1.21 MB	
	Indonesia	id	18	29	242.45 KB	
	Brazil	br	16	30	200.77 KB	
	Netherlands	nl	16	50	1.56 MB	
	Belarus	by	15	53	1.02 MB	
	South Korea	kr	10	34	515.32 KB	



Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2009	10	15	414	1186	16.43 MB
Feb 2009	11	20	427	1044	20.66 MB
Mar 2009	123	162	326	720	149.55 MB
Apr 2009	14	22	190	329	16.31 MB
May 2009	14	37	819	2198	28.23 MB
Jun 2009	40	58	1557	4526	65.59 MB
Jul 2009	26	47	1121	2831	40.65 MB
Aug 2009	24	40	992	2473	79.73 MB
Sep 2009	39	65	826	2065	51.54 MB
Oct 2009	89	149	4424	9905	435.81 MB
Nov 2009	68	105	2348	7293	145.29 MB
<b>Dec 2009</b>	38	70	2403	7492	125.12 MB
<b>Total</b>	<b>496</b>	<b>790</b>	<b>15847</b>	<b>42062</b>	<b>1.15 GB</b>

# Things we are working on...

- Add templates for different families of ontology concepts,
  - Events, Artifacts, Roles, ....
- (Re)Use patterns;
- Support more expressive constructs (axioms) both at modeling time and in import/export
  - Integrate formal modeling functionalities;
  - Present both the formal and informal parts as two views on the “same” knowledge in the MoKi.
- Extend support for validation and revision
  - highlight the effects of changes;
- Extend informal / formal modeling of business processes;
- Include “namespaces”;
- Include different term extractors;
- .....

# And now....

- Play with Moki using the on-line demo at

<http://moki.fbk.eu>

- Send us your feedback;
- Ask us for the (Open Source) code and use it!