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 APOSDELE project

APOSDELE 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.aposdle.org

APOSDELE 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 APOSDELE)
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 ia 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

Main actors

- Knowledge expert (informal knowledge)
- Knowledge engineer (formal knowledge)

MOKi: the Modelling WiKi ---

FONDAZIONE BRUNO KESSLER

center.graz
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

Domain model
- Concept Page
- Individual page
- Property Page
Process page

Sample text: Write a paper

The process of writing a scientific paper

- Define paper’s topic
- Review state of the art
- Organize the original part
- Revise and rewrite
- Submit paper to a Journal
- Submit paper as a technical report
- Submit paper to a conference

Description: The process of writing a scientific paper

Required concept: Publication, ResearchTopic, Event, Person

Category: Process model
Overview Pages

List domain concepts

Number of concepts in the Domain Model: 71

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<th>Concept</th>
<th>Description</th>
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Domain Model: Is_a Browser

- Thing
  - Document
    - Publication
    - Unpublished
  - Event
  - Organization
  - Person
    - Employee
    - AcademicStaff
    - AdministrativeStaff
    - Manager
    - TechnicalStaff
  - Student
  - Product
  - Project
  - Topic
  - Add
    - Edit
    - Delete
Editing templates via forms

Appropriate templates for the different entities
Moki functionalities

- Import/export in OWL and BPMN
- Term Extraction facilities
- Edit a single item
- List browsers
- Graphical browsers
- Validation Scripts and check list

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
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

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Things we are working on…

• Add templates for different families of ontology concepts;
  – Events, Artifacts, Roles, ….

• (Re)Use patterns;

• Support mode 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!