http://ontologydesignpatterns.org [ODP]

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ABSTRACT

We present ontologydesignpatterns.org (ODP), a semantic web portal about ontology design patterns based on wiki technology, which aims at supporting a community around best practices for ontology design. ODP offers services for evaluation and training about ontology patterns, and a repository of OWL ontologies. ODP fosters several kinds of participation, from anonymous, read-only access to open-rating and quality-committee membership. Based on semantic wiki components, we have developed **EvalWF**, an extension for supporting evaluation workflows able to manage the entire lifecycle of a pattern, from submission to certification.

Keywords

Ontology Design Pattern, Best Practises, Ontology Evaluation, Semantic Web Portal, Semantic Wiki

1. ODP ORGANIZATION

ontologydesignpatterns.org (ODP) is a semantic portal dedicated to ontology design patterns (OPs) for the semantic web. The portal is targeted at users who are interested in best practices for ontology design and ontology engineering. OPs are reusable solutions to recurrent modeling problems. As such, they are a preferential route for designing high-quality ontologies. In [1], OPs are classified into different types: logical, content, presentation, correspondence, etc. Currently, ODP supports the lifecycle of *Content* ontology design patterns (CPs) (solutions to content modeling problems, e.g for time, space, biological sequencing, geographic areas, invoicing, etc.). Being integrated with specific modeling problems, CPs are ideally reusable components for building ontologies that are valid with reference to their task and domain. ODP is being extended with facilities for the other OP types as well, and it is being also used as a resource for enhancing collaborative ontology design with the NeOn Toolkit[1], e.g. by matching, specializing, and composing CPs in specific ontology projects [2].

The portal is organized into the following areas:
Community. This area is open to registered ODP user contribution and discussion, and provides a facility for sharing solutions to ontology modeling issues within the community.
Proposed CP. This area is a catalogue of all proposals for CPs. Users are guided through a specific form for compiling their proposal. The proposed OPs are expected to come

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[1]http://www.neontoolkit.org

from practical and successful experiences of ontology development. All proposed patterns belong to the ODP namespace named `Submissions`.
Reviews. This area publishes the reviews of proposed CPs. Proposed CPs can be reviewed by all registered users. However, they are eventually reviewed by at least two members of the Quality Committee, formed by ontology experts. The aim of reviews is twofold: on one hand, they provide ODP users with ontology design rationales related to a specific domain issue. On the other hand, reviews provide the author of a certain CP with guidelines for fixing possible problems in order to get the CP certified.
Catalogue. This is the official CP catalogue. This area collects all CPs that are certified by the ODP Quality Committee. The only difference between certified and proposed CPs is that the formers are guaranteed to be fully described (wrt to ODP specification), certified by the ODP Quality Committee, and always associated with a reusable OWL implementation available for download.
Training. This area collects tutorials, publications, and sample modeling exercises.
Feedback. The area where ODP users can give feedback as issues for improving the ODP web portal through a specific form. The editorial board of ODP uses this feedback as new development or maintenance requirements.
Domain. Each CP or Modeling Issue is associated with a domain. This page lists all domains that are defined in ODP, and allows users to create new ones.

ODP supports five roles: *AnonymousUser*, *ODPUser*, *EBMember*, *QCMember*, *Administrator*.
Anonymous users have read-only access to the whole portal. **ODP users** are part of the ODP Community, and can create or edit articles in the Community area, post modeling issues, create and edit pages about domains, submit CP proposals, making open reviews about other proposals, participate in the discussions (through the discussion page), ask for requirements, or advise the mantainers about a bug. The information content of ODP is managed by the **editorial board** members; users in this group answer feedback, propose, and contribute to content improvement. Furthermore, the editorial board issues new development tasks, which are handled by administrators. **Quality committee** members can post a *quality review* about a CP proposal and help certifying the content of the official catalogue. **Administrators** finally manage user account creation, ODP technical issues and upgrades.

2. ODP TECHNOLOGY AND EVALWF

ODP is a semantic web portal based on wiki technology. ODP software is based on Media Wiki[2], Semantic Media Wiki (SMW)[3], Semantic Forms (SF)[4], and other extensions [5]. All articles/pages of the wiki are assigned a SMW category, and can be related between them through SMW relations, according to a *CP annotation schema*[6]. In order to support the OP evaluation workflow, we have developed **EvalWF**, an extension to SF for supporting evaluation workflows. EvalWF will be released as open source software on October 2008 in the MediaWiki repository. Currently, it runs under and can be tried through ODP. EvalWF allows flexible management of user groups, accounts and wiki namespaces. Furthermore, it allows for handling two levels of reviews, and traceability of relations between the addressed issues and the associated reviews.

Main features of EvalWF are (instantiated for ODP case study):

Customization of default namespace. Typically, MediaWiki pages that are created with no explicit namespace are stored in the `Main` namespace. EvalWF allows for specifying a different default namespace e.g., ODP default namespace is `Community`.

Account Confirmation Process. Administrators can customize specific semantic forms for the account requests process. Information submitted by a user for an account request are visualized by the administrator, who can either accept or not the request. If the user account is created, all information but the email are used in order to create a personal page for the user.

Enhanced field value selection. Fields of semantic forms associated with semantic properties, whose range is a category, can be associated to a SMW query, so as to generate a list of existing pages belonging to that category. Users are assisted to assign existing values to the field; alternatively they can add a new value to the list.

Info tip. An info tip is added to all fields from a form. The info tip shows (by exploiting page inclusion) the description of the semantic property associated with the field.

Two-level evaluation workflow. EvalWF allows for distinguishing two types of reviews: open and specialized reviews. Open reviews can be submitted by any user who has write access to the wiki, while specialized reviews can be only published by a restricted group of users and can be required by the authors of the article under evaluation. Review submissions can be guided by specific, distinguished semantic forms.

Evaluation history. Each review is associated with two versions of the article under evaluation (and vice versa). One is the version of the article that the review refers to, the other is a new version of the article, which addresses the issues raised by the review. This functionality relies the MediaWiki versioning system. Moreover, EvalWF maintains the evaluation history: it shows all versions of an article, related to its evaluation process, and their associated reviews. The evaluation history is a precious source for the analysis of rationales in ontology evaluation. (Figure 1)

The ODP EvalWF. In order to exemplify the EvalWF extension, we show how it is instantiated in the case of ODP. ODP review levels are OpenReviews and QCReviews. OpenReviews are submitted by ODPUsers, while QCReviews are submitted by QCMembers. An ODPUser creates a new CP proposal and can explicitly ask for a QCReview. The CP proposal is added to a list of CPs waiting for evaluation, handled by QCMembers. When a review is created by a QCMember, it appears as a link in the associated CP page. The author of the CP can address the review issues by creating a new version of the CP and can mark the review as 'addressed by' the new CP version. Once QCMembers find the CP ready to be certified, they can easily move it in the official catalogue i.e `Catalogue` namespace, and block the editing of the CP.
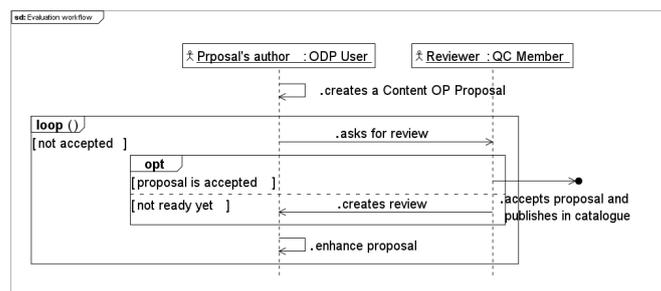

Figure 1: Evaluation example

3. REFERENCES

[1] V. Presutti and A. Gangemi. Content Ontology Design Patterns as Practical Building Blocks for Web Ontologies. In *Proceedings of the 27th International Conference on Conceptual Modeling (ER 2008)*, Berlin, 2008. Springer.

[2] V. Presutti, A. Gangemi, S. David, G. Aguado de Cea, M. Suarez-Figueroa, E. Montiel-Ponsoda, and M. Poveda. Library of design patterns for collaborative development of networked ontologies. Deliverable D2.5.1, NeOn project, 2008.

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[2]http://www.mediawiki.org

[3]http://www.semantic-mediawiki.org

[4]http://www.mediawiki.org/Extension:SemanticForm

[5]The full list of the extension can be found at http://ontologydesignpatterns.org/index.php/Special:Version

[6]http://www.ontologydesignpatterns.org/schemas/-cpannotationschema.owl

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[7]http://www.neon-project.org