Semantic Wiki as an Integrated Content and Metadata Management System

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Abstract

This paper describes a Semantic MediaWiki, a MediaWiki extended to include the ideas of Semantic Web. The proposed Semantic MediaWiki works as an integrated system for content management and metadata management.

1 Introduction

In the increasing interest in the Semantic Web, more and more Semantic Web applications are being developed. One of the current main issues for the Semantic Web applications' development is the simplicity and user-friendliness for the end users, especially for people with non-IT background.

On the other hand, in the context of collaboration on the web, Wiki has proven itself to be a simple and user-friendly interface. For example, the community of Wikipedia.org, the free content encyclopedia is becoming larger and larger. There have been more than 13,000 people who gave their contributions, either by creating or editing articles in Wikipedia. So, it is normal to make an assumption that an extended Wiki will be useful for the development of a simple and easy-to-use Semantic Web application.

This paper presents a Semantic MediaWiki[1]. Semantic MediaWiki is a MediaWiki extended to enable the collaborative editing of metadata according to simple RDF statement.

2 Semantic Extension of MediaWiki

2.1 MediaWiki

MediaWiki is a Wiki software that is written in PHP and uses MySQL database. It is a very useful tool for collaborative content management and is being used to run the Wikipedia and also other encyclopedia and dictionary sites.

MediaWiki also has a category management function that allows a Wiki page under the namespace ("Category:") to be used as a metadata. This function allows the user to create class-sub-class relation and class-instance relation of Wiki pages. In other words, MediaWiki has the capability to manage contents as well as metadata in a separate way, and to manage the relation between contents and metadata. However, this category management function is not able to construct RDF triples, the building blocks of the Semantic Web.

In a MediaWiki environment, it is easy to make an RDF resource, since a Wiki page always has a URL, e.g. http://hostname/ wiki/pagename, and this URL can be used as a URI of an RDF resource. So, constructing RDF triples in a MediaWiki environment can be done by enabling the construction of labeled links [Takeda and Muljadi, 2005]. The labeled link represents the RDF property that links the RDF subject with its object.

2.2 Semantic MediaWiki

Using the existing category management function as a reference, a new namespace ("Term:") is created. A new table is also created in the Wiki database to deal with the new namespace. Wiki pages under this new namespace are being enabled to use the labeled links. The wiki syntax is [[term:target_page|property]]. The RDF triple will be as follow. <*source_page*> <*property*> <*target_page*>. Thus, RDF triples can be constructed in the Semantic MediaWiki.

Each time the wiki syntax is used, the wiki engine will store the RDF triple in the new table in MySQL database. Figure 1 shows the example of the Wiki syntax writing of the RDF triples.

Semantic MediaWiki as an extension of MediaWiki has the benefit of having all the functions available in MediaWiki as a content management system, and by enabling the writing of labeled link, RDF triples can be constructed. Thus, Semantic MediaWiki can also be used as an editor of metadata according to simple RDF statement. As shown in Figure 2, Semantic MediaWiki is an integrated system for content management and metadata management.

Resource	Property	Value
Homer	Wife	Marge
Homer	Child	Bart
Homer	Child	Maggie
Homer	Child	Lisa

Figure 1: Writing RDF triples in Semantic MediaWiki

[1] Our current prototype is accessible from http://www.semanticwiki.jp/

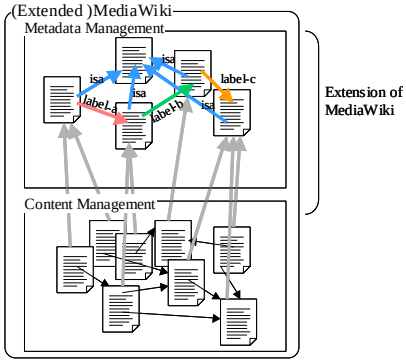

Figure 2: Semantic MediaWiki as an integrated system for content management and metadata management

3 Demonstration

In this section, we show a sample use of Semantic MediaWiki as a collaborative content and metadata editor for a Japanese biodictionary development. Currently, we use MediaWiki 1.3.11 as the base of the Semantic MediaWiki.

A new Wiki page can be created by directly writing the Wiki page name on the browser, e.g. http://localhost/wiki/Term:biology_term. Figure 3 shows a Wiki page of a Japanese biology term. Currently, we have about 1,000 pages as terms in the biodictionary on our system.

Figure 3: Wiki page of a biology term in the biodictionary

Figure 4: Wiki pages of the RDF properties used in the biodictionary

There are three RDF properties used in this biodictionary: Synonym, English and English Synonym. Synonym is used to link a Japanese biology term with its synonym Japanese term. English is used to link a term with its direct translation's English term, while English Synonym is used to link a term with its English term's synonym. Figure 4 shows the displays of each properties' pages. The list of terms which use each properties is displayed in each pages. The property pages can be used as a quick reference for seeing relations of terms. Thus, Semantic MediaWiki is useful for the collaborative editing of contents and metadata according to simple RDF statement.

4 Related Work

There are some other Semantic Wikis being proposed [Tazzoli, 2004] [Aumueller, 2005]. SHAWN, a semantic wiki that is proposed in [Aumueller, 2005] is a well-designed system with the similar purpose to our system. But it is designed to serve as a metadata management system, rather than as an integrated system for content management and metadata management, as the Semantic MediaWiki (see Figure 2).

5 Conclusion

Semantic MediaWiki is proposed as an extension of MediaWiki that is able to write labeled links to construct RDF triples. It is a very simple software and as one tries to use this software, one may enjoy a visible editing of Wiki pages' relations. As it also inherits all the functions available in MediaWiki, it is a useful tool for the collaborative editing of contents and metadata according to simple RDF statements.

However, it is also true to say that Semantic MediaWiki could only handle simple RDF statements. It cannot handle blank node, since a Wiki page should have a name. Further work needs to be done to solve this problem. Another further works that need to be done are enabling Semantic MediaWiki to import RDF statement from external sources, to handle RDFS, and also to construct the inference function within the Wiki environment or by integrating Semantic MediaWiki with external application.

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