Personal Navigation in Semantic Wikis

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Abstract. In this paper, we propose a personal navigation approach to Semantic Wikis. In semantic wikis, wikis pages are annotated with semantic data to facilitate research and navigation. The navigation is collaborative designed and shared by every user. However, individuals involved in a collaborative knowledge building activity need to customize the navigation according to her personal needs. In order to overcome this, we extend semantic wikis with personal annotations facilities to support personal navigation. This approach differs from other adaptive navigation approaches, because of the personalization is carried out by the user herself. We have implemented and validated these ideas on the top of a P2P semantic wiki.

1 Introduction

One of the most characteristic features of Social Web or Web 2.0 systems is users change their participation style. In these systems, users become contributors of contents, being more proactive to edit,they produce and share resources on the Web. In this new approach, computer-supporter collaborative systems (CSCW) have taken a notorious position, specially, those that support a collaborative knowledge building activity [1]. Semantic Wikis [2–4], which are one of the most successful semantic web applications, are well positioned, since they enable users to develop a shared knowledge repository in cooperation.

Semantic wikis differ from traditional wikis. They enable users to add semantic annotations to the wiki pages. These semantic annotations allow us to structure the content of the Wiki and to promote a more suitable navigation. Semantic annotations can be attached according an existing ontology (like in IkeWiki [2]) or by categorizing and adding semantic relationships like in Semantic MediaWiki [3] or Swooki [4]. In the most popular semantic wikis [2–4] the navigation is determined by categories pages and semantic relationships. The resulting navigation is shared among all the users.

However, the individuals involved in a collaborative knowledge building activity, need supports for personal activities [5], even, when this activity is navigation. Therefore, individuals need to be able to adapt wiki navigation to personal needs.

At the moment, personal semantic wikis like SemperWiki [6] supports personal navigation; however, the wiki is dedicated only to one user. On the other hand, in the most of semantic wikis [2–4] the navigational hyperspace is the result of a social process and is shared by every user. Currently, there is no available semantic wiki that combines both personal and shared navigation.

In order to overcome this problem, we propose to extend semantic wikis with personal annotations to achieveing personal navigation. We believe that the fact of adding personal navigation in a semantic wiki enables to provide customized navigation according to user needs, to achieve concept-based navigation [7], to combine personal and shared navigation and consequently, to enrich and augment the shared navigation hyperspace. This approach differs from other adaptive navigation approaches [7], because of the personalization is carried out by the user herself.

In this paper, we present a new approach to support personal navigation in semantic wikis. The Section 2 introduces navigation features in semantic wikis. The Section 3 explains how personal semantic annotations help user to organize personal navigation. The Section 4 presents implementations. The last Section concludes the paper and introduces some future works.

2   Navigation in Semantic Wikis

In most of the existing semantic wikis [2–4], semantic annotations are used to categorize a wiki page and to define semantic relationships. These two kinds of semantic annotations propose two different alternatives to express navigation:

 – Semantic relationships can represent a typed link between wiki pages. These links can be embedded in the wiki content. Therefore, navigation through a semantic relationship is clearly richer than those in traditional wikis.
 – The other alternative is the navigation by means of categories. Each category has its own wiki page. Category pages are useful to browse semantic wikis, because each category page is an access point to wiki pages that were categorized by the underlined concept of the current category. Category pages implement what Brusilovsky calls concept-based navigation [7].

In the most semantic wikis, the navigation is shared among the users. The navigation space is the product of a collaborative activity, where every user is able to categorize wiki pages or to add semantic relationships. However, they do not provide any private and personal navigation. In the next section, we introduce how we have extended semantic wikis under the concept of personal semantic annotation and we explain how these annotations help users to organize personal navigation.

3   Personal Semantic Annotations for Personal Navigation

We have developed P-Swooki [5] as an extension of Swooki, a P2P semantic wiki [4]. P-Swooki supports both personal and shared navigation. Both kinds

of navigation are expressed in a differentiated way. The shared navigation is product of the collaborative knowledge building as in any semantic wiki. The personal navigation is defined by means of personal semantic annotations.

In P-Swooki, for shared navigation, we follow the same approach as in SMW where *shared semantic annotations* are embedded in the wiki text by using a suitable syntax. In this approach, the shared semantic annotations are unique and accessible to everyone. For personal navigation, we propose *Personal Semantic Annotations*.

Personal semantic annotations look like *tags* as it is shown in the figure 1, however they are semantically richer. They can be a *category* or an *individual*. *Categories* define a family of elements, whereas *Individuals* denote elements that fall at least in one category. *Personal semantic annotations* are associated to the wiki page and they are only accessed by the owner user. Every wiki page could be tagged with several personal annotations

Adding *Personal semantic annotations* improves semantic wiki navigation, because:

- Personal semantic annotations enable customized navigation. As personal annotations are handled in a private space, they are only accessible by the owner user. Therefore, users are able to adapt the navigation according to their needs.
- Personal semantic annotations also improve concept-based navigation. The users can define new categories by means of personal category annotations and therefore, they are able to described personal concept-based navigation.
- The personal navigational hyperspace complements the shared one. Consequently, the shared navigational hyperspace is enriched and augmented by the personal navigational hyperspace.

4 Implementation

We implemented P-Swooki as an extension to Swooki. We choose a P2P approach because it is easy to manage the propagation of both kinds of annotations.

In P-Swooki, there are two repositories: a shared and a personal one. Every user works in one peer and has her own copy of shared data. The shared repository is identical for all users thanks to the synchronization algorithm [4]. The personal repository is not replicated to the rest of the peers and users keep personal annotations private.

The figure 1 shows the P-Swooki GUI. On the right, there is a widget which enables to add personal semantic annotations. Such widget also enables us to browse annotations. Additionally, P-Swooki provides a kind of category page as it can be shown on figure 2.

We have conducted some usage studies of P-Swooki. The results of this evaluation showed us the needed of personal navigation features as detailed in [5].
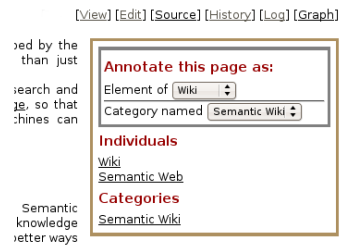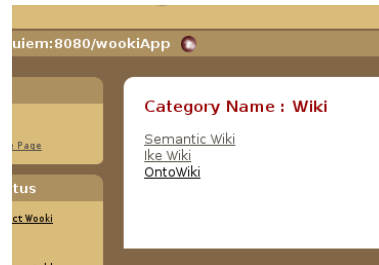
Fig. 1. Personal Annotation Box

Fig. 2. Personal Annotation Navigation Page

5 Conclusions and further work

In this paper, we have proposed an approach to extend semantic wikis navigational capabilities with personal ones. Personal navigation is carried out by the use of personal semantic annotations. By means of personal semantic annotations user can customize navigation according to their needs and to achieve personal concept-based navigation.

Currently, we are working on a transformation algorithm that allows transforming personal semantic navigation into shared one and vice-versa. This will allow enriching both personal and shared navigation.

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