KiWi - A Platform for building Semantic Social Media Applications

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Abstract. The combination of semantic technologies and social software has become more and more popular in the last few years as can be seen by the emergence of Semantic Wikis or the popularity of vocabularies such as FOAF or SIOC. The KiWi project is based upon these principles and offers features required for Social Media applications such as versioning, (semantic) tagging, rich text editing, easy linking, rating and commenting, as well as advanced "smart" services such as recommendation, rule-based reasoning, information extraction, intelligent search and querying, a sophisticated social reputation system, vocabulary management, and rich visualization. KiWi can be used both, as a platform for building custom Semantic Media applications, and as a Semantic Social Index, integrating content and data from a variety of different sources, e.g. Wikis, blogs and content management systems in an enterprise internet. Third-party applications can access the KiWi System using simple-to-use web services. The demo presents the whole functionality of the Open Source development platform KiWi in its final version within one integrated project management scenario. Furthermore it shows different KiWi-based Social Media projects to illustrate its various fields of application.

1 Introduction

Wikis are Web-based applications which allow all users to edit content online. In the same sense, the term "Wiki" refers to a new philosophy of working with web content with the principles of everyone contributing, ease of use, easy linking of information, versioning and web-based media. Semantic Wikis (e.g. Semantic MediaWiki[1] or IkeWiki[2]), which have been developed in the research community in the last years [1,2], combine this philosophy with the intelligence and methods of the Semantic Web. This philosophy holds for other applications as well: Most other social software systems such as blogs, photo sharing sites or social networking platforms share the same basic principles. To leverage on these principles and the power of semantic technologies, the EU-funded project KiWi

[1] Semantic MediaWiki: http://semantic-mediawiki.org
[2] IkeWiki: http://ikewiki.salzburgresearch.at

(Knowledge in a Wiki) builds a generic framework for Semantic Social Media. The demo presents a number of KiWi-based applications (e.g., an artwork portal, an idea management application, a community-based news portal etc.) and demonstrates the added value of the KIWI framework for these applications.

2 The KIWI Framework

The KIWI framework follows a service oriented architecture[3] with a small core and an extension mechanism for developing application-specific actions and program logic on top of it. The core services are usable from any extension and generic jQuery widgets communicating over RESTfull webservices and thus its functionality can easily be reused or adapted by application developers. The KiWi core involves a fully versioned triplestore, a full text and metadata search index (based on Apache SOLR[4]) and services to manage content, users and components.
KiWi follows the resource concept, meaning that everything such as a wiki page, person, tag, ontology class, etc. is a resource itself, a so called ContentItem. A ContentItem can be extended with RDF Relations via a facading mechanism to fulfill specific requirements. The system uses popular ontologies such as FOAF, HGTags, IPTC Newscodes and it is possible to import self-created ontologies as well. The KiWi framework builds heavily on Java Enterprise Edition[5] (Java EE 5) and JBoss Seam[6] (currently version 2.1).

3 Enabling Technologies

3.1 Information Extraction

As described in [3], KiWi combines semantic annotations directly with the text content of the ContentItems and provides advanced user interfaces supporting the annotation process with the help of suggestions coming from an information extraction component. The service uses natural language processing and machine learning algorithms to provide suggestions for annotations.

3.2 Reasoning

KiWi offers a rule-based inconsistency tolerant reasoning that can be explained to users and that also allows for efficient knowledge base updates by the means of reason maintenance, as described in [4]. The reasoner is able to run programs implemented in sKWRL, a simple KiWi rule language.

[3] Link to KiWi Architecture:
`http://www.kiwi-community.eu/display/DOC/KiWi+Architecture`
[4] Apache SOLR: `http://lucene.apache.org/solr/`
[5] Java Enterprise Edition:
`http://www.oracle.com/technetwork/java/javaee/overview/index.html`
[6] JBoss Seam:`http://seamframework.org/`

3.3 Semantic Search

KiWi includes two search engines, both based on a SOLR search index. The first one allows searching on text and RDF metadata as well as facetting on authors, tags, types, RDF literal properties and RDF object properties. Furthermore it is possible to personalize search. The second search engine is able to interpret KWQL queries [5]. KWQL is a rule-based query language based on a label-keyword query paradigm. KWQL allows rich combined queries of full text, document structure, and informal to formal semantic annotations. In addition KiWi provides visKWQL[6], a visual interface for the KWQL language aimed at supporting users in the query construction process.

3.4 Personalization

In KiWi there are several recommender services that use personal activities to enhance content recommendations. As described in [7], the recommenders use traditional tag-based retrieval, external factors such as tag popularity, tag representativeness and the affinity between users and tags. It is also possible to personalize the search by using users personal tagcloud and users personal interests extracted from his or her published content.

3.5 Content Versatility

As described in [8], every piece of information is a combination of human-readable content and associated meta-data, and the same piece of information can be presented to the user in many different forms, even in parallel: as a wiki page, as a blog post, as a comment to a blog, as a photo, or even in a bubble in a map-based application. The decision how the information is displayed is taken based on the context of the content and the user. This is what we call "Content Versatility". In the demo we will show the same content (a meeting in our case) in the KiWi wiki application as well as in TagIt, a KiWi-based application for map based content retrieval. We will also show that different services (e.g. search services) and widgets (e.g. recommender widgets) can be reused by different applications.

4 Demo Outline

Since the last demonstration at European Semantic Web Conference 2009, the project has made considerable progress, which will be presented in this demo. It shows the exploitation of the KiWi system within a project management scenario in which the system is used by a company as a Semantic Wiki to handle its project management. The Wiki is used to manage users, project pages, meetings, meeting minutes, ideas etc. The storyline followed in the demo defines a simple workflow, i.e., how a project can be collaboratively created, structured and edited in KiWi using its enabling technologies. Furthermore it shows how

existing content can versatilely be searched, integrated and displayed. To demonstrate the ability to implement different types of applications on top of KiWi as framework a number of other KiWi-based applications will be presented.

5 Conclusion

The potential of KiWi for building semantic social applications has been demonstrated in several projects that build upon its framework. This includes the idea management software Ideator[9] or the artwork portal ArtAround[7]. Further information about the KiWi project as well as source code and developer support can be found at `http://www.kiwi-community.eu` and the showcase of the current KiWi version at `http://showcase.kiwi-project.eu`.

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[7] ArtAround: `www.artaround.at`