

## Tag, Annotate, Rate and Share: Activities of Daily Living on the Web

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**Abstract.** With the myriad of educational resources available online for free comes a call to provide users with ways to collaboratively filter resources. The Center for Open and Sustainable Learning (COSL) is developing tools meant to do just that. These tools leverage folksonomic metadata. Preliminary analysis has been done with a collaborative, social filtering system developed by COSL.

**Keywords:** tagging, folksonomies, semantic web, collaborative filtering

### 1 Introduction

The Web facilitates open access to a myriad of educational resources. With all of these resources come a number of challenges for potential learners. These include difficulty in filtering, making sense of, and finding ways to reuse educational resources. At the Center for Open and Sustainable Learning (COSL) at Utah State University, we build open source applications to support learners as they collaboratively filter, remix, reuse, and generate Web resources. Projects currently underway and others that are on the table for development can be found at <http://folksemantic.org>.

#### 1.1 The Folksemantic Approach

As folksonomic descriptions of open Web resources have become increasing available, COSL is building tools to leverage them. The semantic meaning of web content is constantly being described as users generate metadata for free. They tag web pages in del.icio.us, images in Flickr, rate movies in Netflix, books in Amazon, and write metadata in freebase. Why? Because it benefits them and it's easy. The currency of the Internet is reputation, and reputation comes on the net as a person blogs, builds a social network on LinkedIn, puts popular videos on YouTube, and becomes the top hit for their name on Google. Users are motivated to generate content so they can become more visible and thereby more reputable. This turns out to be an incredibly sustainable system. Instead of spending money on generating content, online sites can rely on users to do it for them.

The Folksemantic approach leverages the motivation users have to build their reputation via interacting with others and generating content on the Web. The tools we build allow users to continue to generate, tag, and remix Web content while building not only their reputations, but relationships with other users in the same space.

The relationship the Folksemantic tools have with users is symbiotic. As users tag, share, remix, rate, and discuss content, they are generating metadata about that content. There are no complicated XML requirements, the user doesn't have to know RDF, it is all generated behind the scenes. Metadata is derived automatically from the user's natural interaction with the Web content. The Folksemantic tools harvest this data which can then be reassembled in interesting ways using our infrastructure tools, mashups, and partner integration tools (widgets).

The Folksemantic tool set uses social networking to encourage user interaction and user generated content. These tools empower end-users by enabling the "write" part of the web. These informal opportunities to interact and generate content encourage learning in a context outside of traditional educational institutions. On the web today there are many end users capable of generating high quality content. The Folksemantic tool set supports the organic assembly of this content into larger parts and communities. This allows learning and propagation of human knowledge to occur in their natural contexts. These tools provide opportunities to reuse, remix, and generate meaning around resources as users interact with the resources, the tools, and with one another.

The value of the Folksemantic tool set is in harnessing user activities in context. Users receive immediate benefit and are motivated by the immediacy of the reward. User's don't have to be persuaded to bookmark using del.icio.us or post videos to YouTube. Instead, they are motivated by the immediate value that these tools provide. The tool providers in turn receive value from the vast amounts of user generated metadata and content. These rich resources can be coupled with content and metadata provided by universities via OpenCourseWare, digital libraries such as the National Science Digital Library, and the Smithsonian Institute. The pairing of both user generated and institutionally generated content and metadata can provide users access to richer, more contextualized, and more meaningful resources.

One principle of the Folksemantic tool set is openness, particularly as it relates to data retrieved through the activities of users of the various tools. As users generate content and accompanying metadata in the form of titles, tags, and descriptions, that metadata is collected. Through the gathering and the (here's the openness part) sharing of that metadata via current and emerging sharing standards.

## **2 Folksemantic Tools Description**

Over the last year, COSL has built a number of infrastructure tools and web services/applications that lay the foundation for our future work. These tools allow users to write to the web, reuse, remix, and generate (along the way) machine-readable metadata. In Annorate (<http://annorate.com>) users can make annotations on any web page. The OCWfinder (<http://ocwfinder.com>) leverages tagging technology

to help users locate openly available OpenCourseWare materials. Send2Wiki (<http://send2wiki.com>) provides a one-click option for users to pull content from any given web page and drop it directly into a wiki for alteration. Ozmozt (<http://ozmozt.com>) helps users share resources with others, utilizes user generated metadata and aggregates user identities. And scumdidilyumptio.us (<http://scumdidilyumptio.us>) is a foundational service that holds user generated metadata and relationships between web resources in a matter that is easily shareable with other systems via XML, RSS, RDF, REST, or HTML.

Through the development of these tools, and as emerging technology made its way into our design and development processes, we have determined a number of opportunities for future work. Future goals include enhancing existing tools and developing new infrastructure pieces and web services/applications. Enhancements include implementing a one-stop authentication system, such as OpenID, incorporating APIs, and developing a widget strategy for each of our existing and future tools. These enhancements will provide a simpler user experience, and allow users and other developers open access to folksonomically described web resources. In accordance with the core values of openness at COSL all folksemantic data is provided back to users and developers via standard formats. Our current tools provide RSS, Atom, and RDF. Future tools will also include full REST based APIs. These APIs will let users reassemble and reuse their content via widgets that they can include in their own websites or use to enhance their browser.

### **3 Preliminary Analysis of the Share Tool**

Of the tools developed thus far, we have the most data on the share tool inside of Ozmozt. Users browse to any Web resource and then can click a button on their browser that allows them to easily share that resource with friends or groups. An analysis was done after the system was live 2 months when there were less than three hundred users.

An analysis of resources shared in Ozmozt uncovered 311 resources shared from users to groups, and 111 that users shared directly with other users. Resources shared were often blog posts or articles on a number of topics. Most common topics shared were technology, education, recreation, and humor. Each resource shared had fields for a title, description, and tags. Users could select to alter the page title but the system pulled the page title from the HTML of the original page and most users did not alter this title.

The description field could include a clipping from the original article or other description as chosen by the user sending the resource. About half of the resources shared included content from the original resource. Of the remaining resources shared, some users left the field blank and others typed in their own description. All resources shared had tags associated with them. Resources were tagged anywhere from one to six times, with users displaying unique tagging patterns.

Other tools are on schedule for analysis as they mature and their user base increases.

## **4 Enablers, Challenges, and Lessons**

The Folksemantic team have run up against both enablers and challenges throughout the development and deployment phases of these tools. These have helped us formulate our own guidelines for developing collaborative filtering systems.

Using Ruby on Rails as a web development framework and keeping visual designs simple have allowed for rapid tool development. We learned the hard way to keep our visual design simple. When first developing Ozmozr, we spent most of our time implementing a complicated design. After spending months on that design, we altered our approach for subsequent tools. This allowed us to develop a simple template for the deployment of these systems online.

Other enablers included talented programmers, a collaborative team environment, and a willingness to abandon code or even entire projects if they were too messy or time consuming. Additionally, the aggressive timeline for tool deployment set by our funding agency encouraged creative planning and prioritization of projects.

Other challenges included developing a healthy user-base. With one application being deployed a month, the focus was on tool development, not user base. The tools were showcased at a number of educational and cross-disciplinary conferences. However, releasing the tools into the world of Web2.0 requires press releases, along with strong support from key internet power-users.

## **5 Future Directions**

The Folksemantic toolset has been deployed and will continue to be supported as users call for improvements. One tool, Ozmozr, is set for a major revisal into a social linked data-sharing environment for scholarly interactions.

However, many of the tools built during this initial round of development will be used primarily as building blocks for future projects to support open scholarly discourse. The lessons learned in this round of development will allow for more an approach that targets a scholarly user-base and allows for linkages between resources.