

Tag Mediated Society with SCOT Ontology

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Abstract. In this paper we give an overview of the `int.ere.st` for a social tagging, bookmarking, and sharing service. It is based on the SCOT ontology. The SCOT ontology can represent the structure and semantics for social tagging data and provide methods for sharing and reusing them. We describe how it enables users to participate in a semantic social tagging from functional point of view and show how `int.ere.st` allows users to save, tag, and search SCOT ontologies. All kinds of user contributions in the system will be exposed as RDF vocabularies that connect them. We believe it is a good starting point to build Semantic Web based society using tagging data.

1 Introduction

At the moment, there are number of issues related to the activity of tagging in web-based (and desktop) content creation applications. Firstly, when moving from one site to another, users may not wish to recreate their existing tag information on other sites. Secondly, there is no consistent method for reusing one's personal set of tags between either web-based systems, desktop applications, or for transferring tags between the desktop and the web. Thirdly, there is no easy methods for receiving suggestions for tags based on a history of previously-annotated content created across various spaces. Also, there is little tag reuse occurring between people in existing social networks, which could be used to connect people who may have a common interest of set of interests. Finally, together, and who has used a particular set of tags.

In this paper, we give an overview of `int.ere.st` for social tagging, bookmarking, and sharing service, that aims to address the issues listed above. Furthermore, the main objective of `int.ere.st` is to demonstrate how Semantic Web and Web 2.0 technologies can be combined to provide better metadata creating and sharing support across online communities. The resources of the site is fully based on RDF vocabularies, in particular SIOC¹), FOAF²), and SCOT³).

¹) <http://sioc-project.org>

²) <http://www.foaf-project.org/>

³) <http://scot-project.org>

We think it is a good starting point to build tag mediated society based on Semantic Web technologies using tagging data. This paper gives some details about `int.ere.st`. The online demo can be found at: <http://int.ere.st>.

2 Background

Many people already know how to bookmark and tag online resources such as Web sites, bookmarks, photos, and blog posts. Tagging is a way for representing concepts by cognitive association techniques, but does not force us to categorize. Each tag tells us about what we are interested in and improves social reinforcement through enabling social connections and search. A number of social bookmarking and tagging sites have become popular, and tagging in traditional web sites is getting adopted at a good pace. There is an advantage that social bookmarking and tagging is a simple way that allows a user to save and share anything in online communities.

But the critical problem is that the social bookmarking and tagging systems do not provide a uniform way to share and reuse tag data among users or communities. Although some systems support an export functionality using open APIs, there are no uniform structure and semantics to represent tag data. Therefore, it is not easy to meaningfully search, compare or merge “*similar collective tagging data*” [5] on different sources.

We suggest the semantic model to solve the limitations. The SCOT (Social Semantic Cloud of Tags) ontology⁴) is an ontology for sharing and reusing tag data and for representing social relations across different sources. It provides the structure and semantics for describing resources, tags, and users, and provides extended tag information such as synonym, spelling variant, tag frequency, tag co-occurrence frequency, and tag equivalence in order to reduce tag ambiguity.

SCOT can be classified into two main types: *personal* and *group*. The former has a single user and is created from a single tagging site while the latter has multiple users (members) or multiple sources. A group SCOT can be created by combining or integrating personal SCOT ontologies.

3 Overview of `int.ere.st`

`int.ere.st` is a social tagging, bookmarking, and sharing service for SCOT ontologies. It enables aggregation of SCOT ontologies from various tagging sites, retrieves the ontologies by person, tag, and object, and shares the ontologies among users and communities.

With `int.ere.st`, users can save, tag and bookmark their own as well as others’ SCOT ontologies. The tag meta-search allows users to look for similar patterns of tagging or persons with their interest based on tags.

`int.ere.st` enables users to create Semantic Web data, such as FOAF, SIOC automatically. RDF vocabularies can be interlinked with the URIs of SCOT

⁴) <http://scot-project.org/scot/ns>

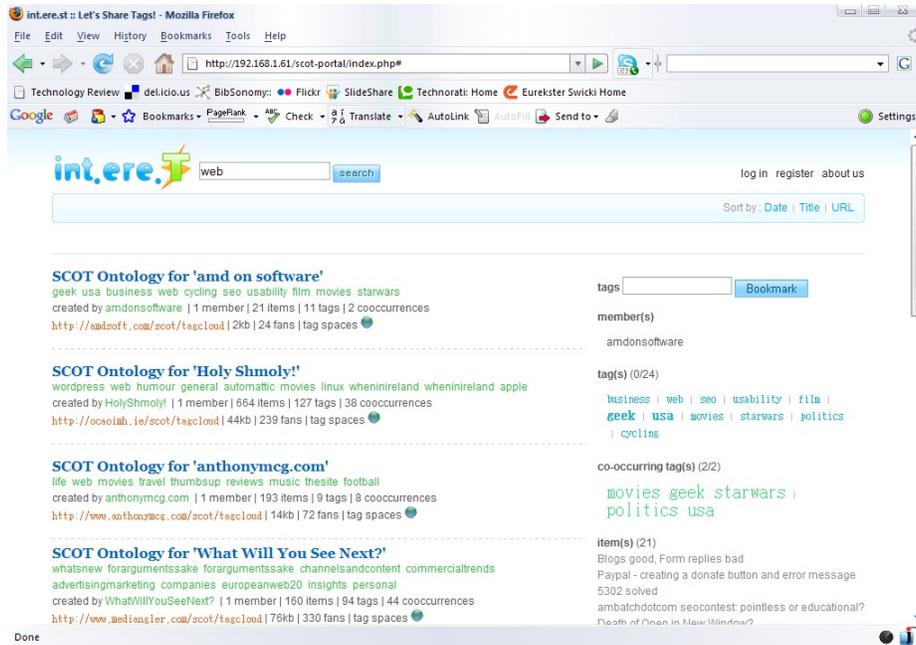


Fig. 1. int.ere.st

ontologies that are generated in the site and shared in online communities. There is a quick start guide[6] to describe an overall process for the site.

We take some use cases on the tag sharing[5] from Tagcommons to make implementation guidelines. The use cases are very informative in that they provide technical and functional requirements for tag sharing. We find that all the use cases except the case 7 (Organizing Document Using Tags) are very close to the services of int.ere.st.

3.1 Personal Bookmarking across tagging sites

One of the goals for int.ere.st is to provide a way for a user to manage and bookmark tagging data from different contents and different tag spaces. SCOT data is exposed using exporters for WordPress and other relational database-type blog platforms. Future work will focus on exposing SCOT data from other applications, such as Flickr or del.icio.us. With the SCOT Exporter, a user can create a SCOT ontology from a single online community. Ontologies can be shared and reused as RDF itself. The Exporter, however, provides a simple method for exposing a SCOT ontology, but no method for managing one. To achieve comprehensive management of personal tagging data, we provide a simple importing method in which a user can import his/her SCOT as a file or URL. Imported SCOT ontologies will be updated, managed, and shared through the “let’s share” menu in the system.

3.2 Browsing and searching other's tag data across sources

The use case focuses on an aggregation service to compare, connect, and integrate tagging data across different sources. The aggregator for the imported SCOT run by periodically and automatically. Users can find common tags by using SPARQL-based semantic search methods as described below:

- and: '&' sign (ex. web & blog)
- or: space (ex. web blog)
- co-occurring: '+' sign (ex. web + blog)
- broader relationship: '>' sign (ex. web > blog)
- narrower relationship: '<' sign (ex. blog < web)

We display the tag space information which shows where SCOT ontologies come from. It is useful to SCOT types. If a SCOT is of group type, it must have at least two different sources (see Fig. 2).



Fig. 2. interface for a search result

When choosing one of the search results, the users can get meta-information for each SCOT ontology such as members, top 10 tags, creator, total posts, and total tags. We also provide a bookmarking and tagging method for each SCOT so that the user can participate in tagging activity and share the experiences of other people. When a user click the Title on Figure 2, detailed information is returned (see Figure 3).

3.3 Social Search Using Tag Data

Social search, influenced by human judgement, takes many forms, ranging from simple shared bookmarks or content tagging to more sophisticated approaches that combine human intelligence with algorithmic searches.

A user can take advantage of all the work other people have done. We provide the 'fans' as a concept for a list of people (see Figure 4). When someone has added a certain SCOT as a bookmark, a connection can be created. If a user makes a new group SCOT with existed group SCOT ontologies, the use can get various types of information such as networks and bookmarks. This will help users find interesting new people in the system, much as a user refers to ontologies to find interesting new ones.

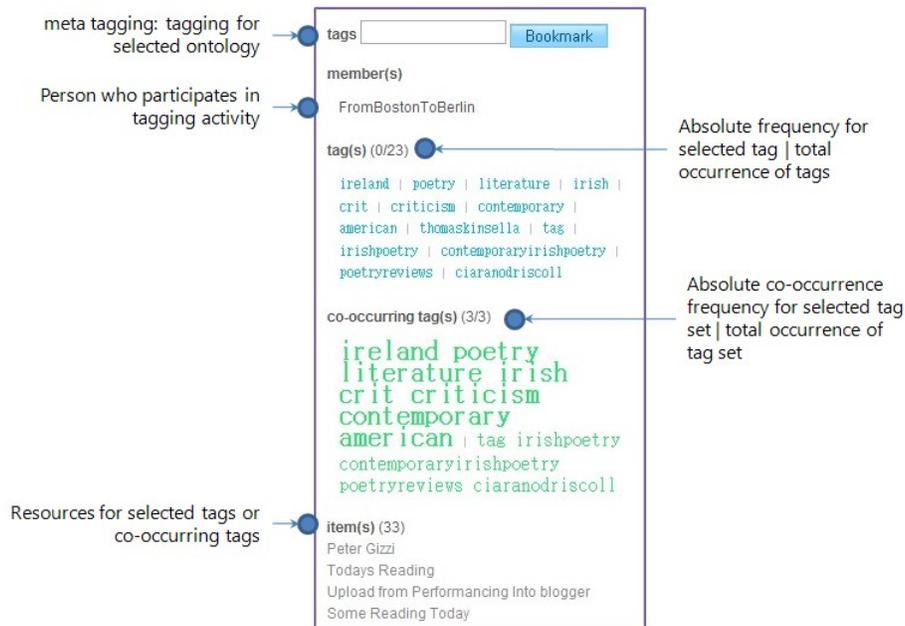


Fig. 3. Detailed information for a selected SCOT

3.4 Multimedia Cross Reference

We provide a common mechanism to integrate multiple SCOTs from different sources. The important thing is that a group SCOT can be created regardless of tag spaces. For instance, some SCOT ontologies in the system have the multiple references such as WordPress⁵⁾, CiteULike⁶⁾, mar.gar.in⁷⁾ and so on. So it is possible to provide a rich reference source of connections for tag data. Figure 5 shows the “*my interests*” menu that contains a list of bookmarked SCOT. If a user checks out some item and then he/she can get a group SCOT using the “*build group SCOT.*”

3.5 Distributing tagged information to the Semantic Web

int.ere.st exposes various and structured types of user contributions in the system and also connects to other sources of data using Semantic Web technologies. For instance, personal information can be exposed as FOAF in the system. Tag information can be generated as internal or external SCOTs. In addition, the system can expose a SIOC ontology by combining FOAF, SCOTs, and Bookmarked SCOTs. The FOAF, SIOC, and SCOT together provide a way

⁵⁾ <http://wordpress.org>

⁶⁾ <http://www.citeulike.org>

⁷⁾ <http://mar.gar.in>



Fig. 4. my fans: a list of referring or referred ontologies. When a user clicks a certain fan, all the ontologies for selected user are returned.

to enhance social connections and are distributed and shared among people. Figure 6 illustrates how RDF vocabularies are interlinked with each other. The proposed model can be considered as personal semantic spaces because it covers various personal activities in online communities. It might be possible that a semantic society comes into shape by integrating among personal semantic spaces.

4 Sample data

As a test set of data (see Table 1) we have included three tagging data: the Ireland site⁸⁾ for Planet Journals which is a RSS aggregator website that collects specific blogs for residents or citizens of Ireland; CiteULike which is a free online service to help academics to share, store, and organize the academic papers and to allow users to assign tags with various subjects; mar.gar.in which is a Korean bookmarking service and its functionality is quite similar to del.icio.us.

	ireland	citeulike	margarin	Σ
users	1322	1602	2584	5508
tags	13688	22409	15803	51900
total tags	68785	83379	101690	253854

Table 1. Dataset for int.ere.st

⁸⁾ <http://planet.journals.ie>

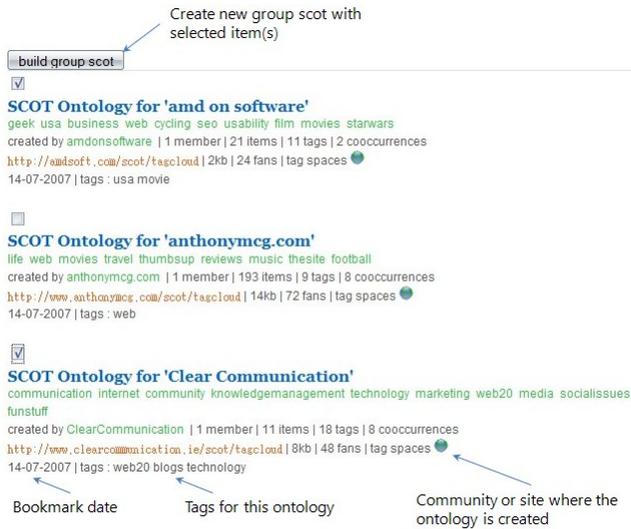


Fig. 5. my interests: it is a bookmarked ontology with tagged data. A user can create a group SCOT by combining items on the list.

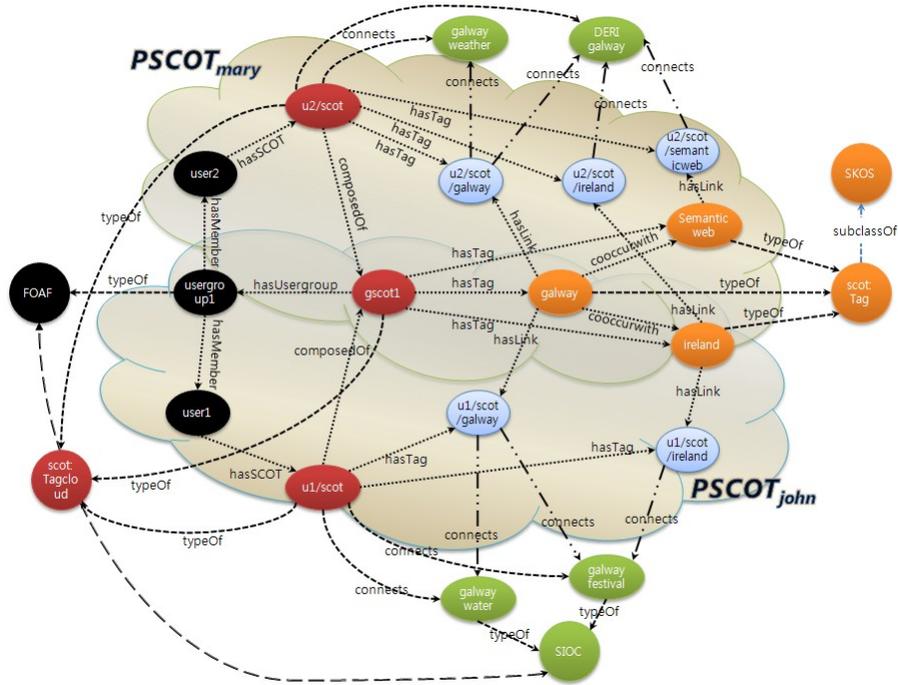


Fig. 6. Relationship between RDF vocabularies and SCOT: *gscot₁* is composed of both *PSCOT_{mary}* and *PSCOT_{john}*. FOAF has information about Mary and John and also has URIs for their SCOTs. Each SCOT can be connected with *sioc:Post* as the URIs.

5 Conclusions

We have proposed a system that aggregates, retrieves, and shares tagging data based on the SCOT ontology. It enables users to manage their tagging data as ontology and enhance tag sharing. We also provide a way to describe a personal semantic space using Semantic Web technologies. In other words, it facilitates creation and sharing of semantic metadata. We plans to extend and improve the SCOT Exporter for applying to various online communities. We provides more detailed information about the SCOT ontology at <http://scot-project.org> and the service for tag sharing is provided at <http://int.ere.st>.

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