The State of the Art in Tag Ontologies: A Semantic Model for Tagging and Folksonomies

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This Presentation

I. Background

II. Tagging Models and Tag Ontologies

III. Comparison of Existing Tag Ontologies
I. Background
HOW MANY MODERN SOCIAL SITES DO NOT SUPPORT TAGGING?
Easy-to-use

Created by user participation

Collective ‘intelligence’

Emergent semantics
II. Tagging Models and Tag Ontologies
Core Concepts

- **Tag**: a word or phrase that is recognisable by people and computers

- **Resource**: a thing to be tagged, identifiable by a URI or a similar naming service

- **Tagger**: someone/thing doing the tagging, e.g. user of an application
TAGGING

We tag a specific resource with keywords.
Tagging := (user, tag, resource)
Personal tagging (non-social)

Social interaction across different systems?

Folksonomies: collaborative tagging

‘Picture Credit: Maarten Janssen, 2006’
Folksonomy :=
(Tag Set, User Group, Source, \textit{Tagging}, Occurrences)

\textit{Tagging} := (user, tag, resource)
CURRENTLY

User assigns a Tag to a Resource in a specific system.

We don’t know the relationships

No standard to enable reuse among different systems
The structure of Tagging elements (People, Tags, Resources, ...) can be defined in human-readable \textit{AND} machine-processable ways.

\begin{verbatim}
<tag:name> bear </tag:name>
\end{verbatim}
The **MEANING** of Tagging elements (People, Tags, Resources, ...) can also be defined in a machine-processable way.
ONTOLOGIES

Enable:

• *Increased Knowledge Representation Sophistication*

• *Machine Processable Representation*

• *Facilitation of Knowledge Exchange*
TAG ONTOLOGIES: Allow us to represent tagging elements and their relationships at a semantic level.

“A little semantics goes a LONG way”
III. Comparison of Existing Tag Ontologies
## Selected Tag Ontologies

<table>
<thead>
<tr>
<th>Ontology</th>
<th>URL</th>
<th>Update</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gruber</td>
<td><a href="http://www.holygoat.co.uk/projects/tags/">http://www.holygoat.co.uk/projects/tags/</a></td>
<td>Nov ’05</td>
<td><a href="http://revyu.com">http://revyu.com</a></td>
</tr>
<tr>
<td>Newman</td>
<td><a href="http://code.google.com/p/tagont/">http://code.google.com/p/tagont/</a></td>
<td>Jan ’07</td>
<td>-</td>
</tr>
<tr>
<td>Knerr</td>
<td><a href="http://eslomas.com/tagontology-1.owl">http://eslomas.com/tagontology-1.owl</a></td>
<td>’07</td>
<td>-</td>
</tr>
</tbody>
</table>
| Echarte  | http://scot-project.org | Jun ’08 | http://int.ere.st  
|          |  |  | http://relaxseo.com  
|          |  |  | http://openlinksw.com  
| SCOT     | http://moat-project.org | Feb ’08 | http://openlinksw.com  
|          |  |  | lord.info  
| MOAT     | http://www.semanticdesktop.org/ontologies/nao/ | Aug ‘07 | Nepomuk  
| NAO      | | | |
## Ontology Class Comparison (selection)

<table>
<thead>
<tr>
<th>Model</th>
<th>Resource</th>
<th>Tag</th>
<th>Tagging</th>
<th>User</th>
<th>Group</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gruber</td>
<td><em>Object</em></td>
<td><em>Tag</em></td>
<td><em>Tagging</em></td>
<td><em>Tagger</em></td>
<td></td>
<td><em>Source</em></td>
</tr>
<tr>
<td>Newman</td>
<td>rdfs:Resource</td>
<td>:Tag</td>
<td>:Tagging</td>
<td>foaf:Agent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Echarte</td>
<td>:Resource</td>
<td>:Tag</td>
<td>:Annotation</td>
<td>:User</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCOT</td>
<td>sioc:Item</td>
<td>:Tag</td>
<td>tags:Tagging</td>
<td>sioc:User</td>
<td>sioc:Usergroup</td>
<td>sioc:Site</td>
</tr>
<tr>
<td>MOAT</td>
<td>rdfs:Resource</td>
<td>tag:Tag</td>
<td>tags:Tagging</td>
<td>foaf:Agent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAO</td>
<td>rdfs:Resource</td>
<td>:Tag</td>
<td></td>
<td></td>
<td>:Party</td>
<td></td>
</tr>
</tbody>
</table>
## Ontology Property Comparison (selection)

<table>
<thead>
<tr>
<th>Resource</th>
<th>User</th>
<th>Tag</th>
</tr>
</thead>
</table>
| Resource |      | tags:taggedWithTag | scot:hasTag  
|          |      | nao:hasTag         | |
| User     |      | scot:usedBy        | tags:equivalentTag  
|          |      | nao:creator        | tags:relatedTag  
| Tag      | tags:isTagOf | scot:aggregatedTag | tags:spellingVariant  
|          | scot:tagOf  | scot:delimited     | ec:hasTag  
|          | nao:isTagFor| tagont:sameTag     | |
|          | ec:hasRelatedResource |                           | |

Table 4. Object Type Properties. The table shows relationships between core concepts, interpreted as domain (row) – property – range (column)
Inclinations and Representation Levels of Selected Ontologies
MOAT (Meaning Of A Tag)
SCOT (Social Semantic Cloud of Tags)
Linking among Tag Ontologies
Folksonomies: Linking Tag Clouds
Conclusion

Tagging := (User, Tag, Resource)

Folksonomy :=
(Users, Tags, Source, Tagging*, Occurrences*)

• Existing Tag Ontologies do not represent Collaborative Tagging well enough on their own.

• SCOT + MOAT + additional vocabularies (SIOC, FOAF, DC, etc.) provide sufficient representation for Collaborative Tagging & Folksonomies

• Thus, Tag Ontologies provide the possibility for machine-processable representations that can be shared across social tagging systems.