Meaning Of A Tag: A collaborative approach to bridge the gap between tagging and Linked Data

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Tagging is widely used but ...

« A folksonomy represents simultaneously some of the best and worst in the organization of information » Adam Mathes (2004)

• Ambiguity
  • A single tag can refer to various concepts
  • Acronyms, ambiguous names …
    • Paris - City or People ?
    • SWIG - Semantic Web or C++ ?

• Heterogeneity
  • Different tags can refer to the same concept
  • Case-variation, synonymy, internationalization …
    • Beijing, Pekin - The same city
    • SemanticWeb, SemWeb, SW - The same technology

• Lack of organisation
  • No relationship between tags
    • SemWeb, RDF, SPARQL - How to find one tag from another ?
... lacks of semantics

- Tags are just keywords
- They do not care any machine-readable information
- Computers cannot understand what the users have in mind when tagging content
Tags and the Semantic Web

• The Tag Ontology provides a way to represent tags and tagging actions in the Semantic Web
  • tags:Tag rdfs:subClassOf skos:Concept
  • tags:Tagging and tags:RestrictedTagging
• SCOT - Social Semantic Cloud Of Tags - provides a way to model and share tagclouds between social tagging websites
  • scot:Tagcloud sioc:taggingActivity tags:Tagging
  • scot:Tag scot:cooccurs_in scot:Cooccurrence
• But… what about the meaning of tags?
  • « When I tag this blog post ‘Paris’, I mean the French city »
• This is what MOAT is about
MOAT - Meaning Of A Tag

• MOAT - http://moat-project.org

• MOAT aims to provide
  • An ontology to represent *global* and *local* meaning of tags in a machine-understandable way, using URIs of LOD resources to define those meanings
  • A framework to assign and share meanings to tags in a collaborative and open way
  • A way to let tags embeds themselves their semantic
  • A process to create Linked Data from simple tagging actions
Tags and their meaning

• Tagging action is usually defined as a tripartite model
  • Tagging(User, Resource, Tag)
• MOAT extends the model with the local meaning of a tag
  • Tagging(User, Resource, Tag, Meaning)
  • “In this tagging action ‘paris’ refers to the french city”
• Yet, a tag can have different global meanings in a folksonomy space
  • Meanings(Tag) = {((Meaning, {User}))}
Modeling meanings, tags and tagging actions

• Defining meanings
  • A need for machine-understandable meanings
    • Using URIs of existing resources from LOD datasets
    • ‘paris’
  • The MOAT Ontology - http://moat-project.org/ns
    • Modeling tags
      • Tag class, extending the Tag Ontology, mappings with SCOT in progress
      • Cardinality restriction regarding the name property (=1)
    • Modeling global meanings of a tag
      • hasMeaning property and TagMeaning class + meaningURI property
      • Relies on FOAF for the user aspect - cardinality>=1
    • Modeling local meaning of a tag
      • Based on the RestrictedTagging class for the Tag Ontology
      • tagMeaning property to define local meaning of a tag - cardinality=1
MOAT ontology diagram
MOAT data example

<stdio://tags.moat-project.org/tag/paris> a moat:Tag ;
moat:name "paris" ;
moat:hasMeaning [ 
  a moat:Meaning ;
  moat:meaningURI <http://sws.geonames.org/2988507/> ;
  foaf:maker <http://example.org/alex/> ] ;
moat:hasMeaning [ 
  a moat:Meaning ;
  moat:meaningURI dbpedia:Paris_Hilton ;
  foaf:maker <http://myblog.net/user.rdf#me> ;
Creating Linked Data from tagging
The MOAT framework

- **Goal:** provide an easy way to create *local* and *global* meanings for tags
- **A client-server approach**
  - People subscribe to a MOAT server and install a client on their tagging software
  - When people create tagged content, client queries the server for tags meaning(s) and lets user define with new ones if needed
- **A collaborative and decentralized approach**
  - Anyone can benefit from user-defined meanings in a community
  - Needs only a few active users to be deployed
  - Clients can be anywhere on the web, on any platform
The MOAT framework architecture

User creates content and tag it

User chooses meaningful URI for each tag

User saves the content

Client queries the MOAT server for each tag

For each tag, server returns a list of URIs that defines a potential meaning for the tag

Content enters the Semantic Web

http://example.org/blogpost

http://something.net/resource

http://geonames.org/resourceId>

http://dbpedia.org/resource/example>

http://myrdfstore/uri>

http://something.net/resource>
MOAT architecture principles

• REST-ful way to exchange between a server and clients
  • Data exchanged between both is modeled in RDF
  • Each tag URI on the MOAT server is dereferencable
  • Uses content-negociation
    • http://tags.moat-project.org/tag/rdf
  • Provides direct access to RDF and json output
    • http://tags.moat-project.org/tag/rdf/json
  • Update tag description by sending an RDF file with TagMeaning instances to the server
    • API key to restrict updates within a community
Current implementations

• **MOAT Server**
  - Current implementation as a PHP5 application
  - Can be plugged-in on any triple-store (ARC2, 3store bindings)
  - Open-source
  - [http://moat-project.org/server](http://moat-project.org/server)

• **MOAT Clients**
  - *Drupal* client, features *Sindice* interaction
    - Helps users to find new URI if needed
  - *OpenLink Virtuoso*
  - [http://moat-project.org/clients](http://moat-project.org/clients)
MOAT, Drupal and Sindice

From tagging to Semantic Web

Define the meaning of your tag(s) in the current context.

- **barcamp**
  - **New URI ?**: http://dbpedia.org/resource/BarCamp
    - Click to find relevant URIs from Sindice

- **paris**
  - http://sws.geonames.org/2988507/
  - http://sws.geonames.org/4402452/
  - http://dbpedia.org/resource/Paris
  - **New URI ?**: 
    - Click to find relevant URIs from Sindice

- **sparql**
  - http://dbpedia.org/resource/SPARQL
  - **New URI ?**: 
    - Click to find relevant URIs from Sindice

Sindice search

- barcamp
    - 2007-12-28 - 18 triples - 2066 b
    - 2007-12-28 - 18 triples - 2063 b
    - 2007-09-21 - 130 triples - 11890 b
  - http://www.talkdigger.com/sioc/barcamp.org/PreviousBarCamps.xml
    - 2007-12-21 - 130 triples - 11890 b
  - http://dbpedia.org/resource/BarCamp
    - 2007-10-23 - 292 triples - 10364 b
  - http://dbpedia.org/resource/BarCamp
  - http://www.talkdigger.com/sioc/barcamp.org/xml
    - 2007-12-28 - 847 triples - 80870 b
  - http://www.talkdigger.com/sioc/barcamp.org/xml

Type in the search string
New ways to interlink RDF data

- By linking tagged content to URIs, it provides new way to connect those contents
- Helps SIOC entering the Linked Data Web
  - Since sioc provides a way to represent tagged content
    - sioc:Item and its subclasses
    - sioc:topic property
Summary

• MOAT is about
  • Offering an RDF model to define the meaning(s) of tags
  • Providing a way to let tagged content enters the Linked Data Web
  • Offering a framework to collaboratively achieve this goal

• MOAT is not about
  • Automatic identification of URI from tag
  • Automatic disambiguation of tags
  • Ontology mining from tags
  • … but can provide an RDF model for such algorithms
Thank you! / Questions

http://moat-project.org
http://apassant.net