Data Integration in Semantic Web

By
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Summary of Previous Work

- Why is there a need of interoperability in Web 3.0?
- Web Personalization and Better Recommendations for Web 3.0
- What is being done in data integration? SCOT, FOAF, SKOS and SIOC.
- A prototype of social semantic web portal.

Today's Topics

- Role of Ontologies in Integration of XML Data.
- Semantically Interlinked Online Communities. (SIOC)
- Friend of a Friend Ontology (FOAF).
- Simple Organization of Knowledge Systems (SKOS).
- SIOC+FOAF+SKOS.
- Social Semantic Cloud of Tags (SCOT).

Data Integration of XML sources

- Approach used - Hybrid Ontology Approach
- Uses of ontology in data integration
  - Metadata Representation : Forming of local ontologies in a single language
  - Global Conceptualization : The global ontology provides a conceptual view over the schematically heterogeneous source schemas.
  - Support for high level queries : Given a high-level view of the sources,as provided by a global ontology, the user can formulate a query without specific knowledge of the different data sources.
  - Mapping Support :A thesaurus, formalized in terms

SIOC

SIOC

- **Main classes of SIOC ontology are;**
  - **Site**-Location of Online Community,
  - **Forum**- Channel or Discussion Area,
  - **Post**- Article posted on Forum,
  - **Event**- is a real or virtual event with a single or multiple users,
  - **Group**- set of users with a common interest,
  - **User**- member of an online community.

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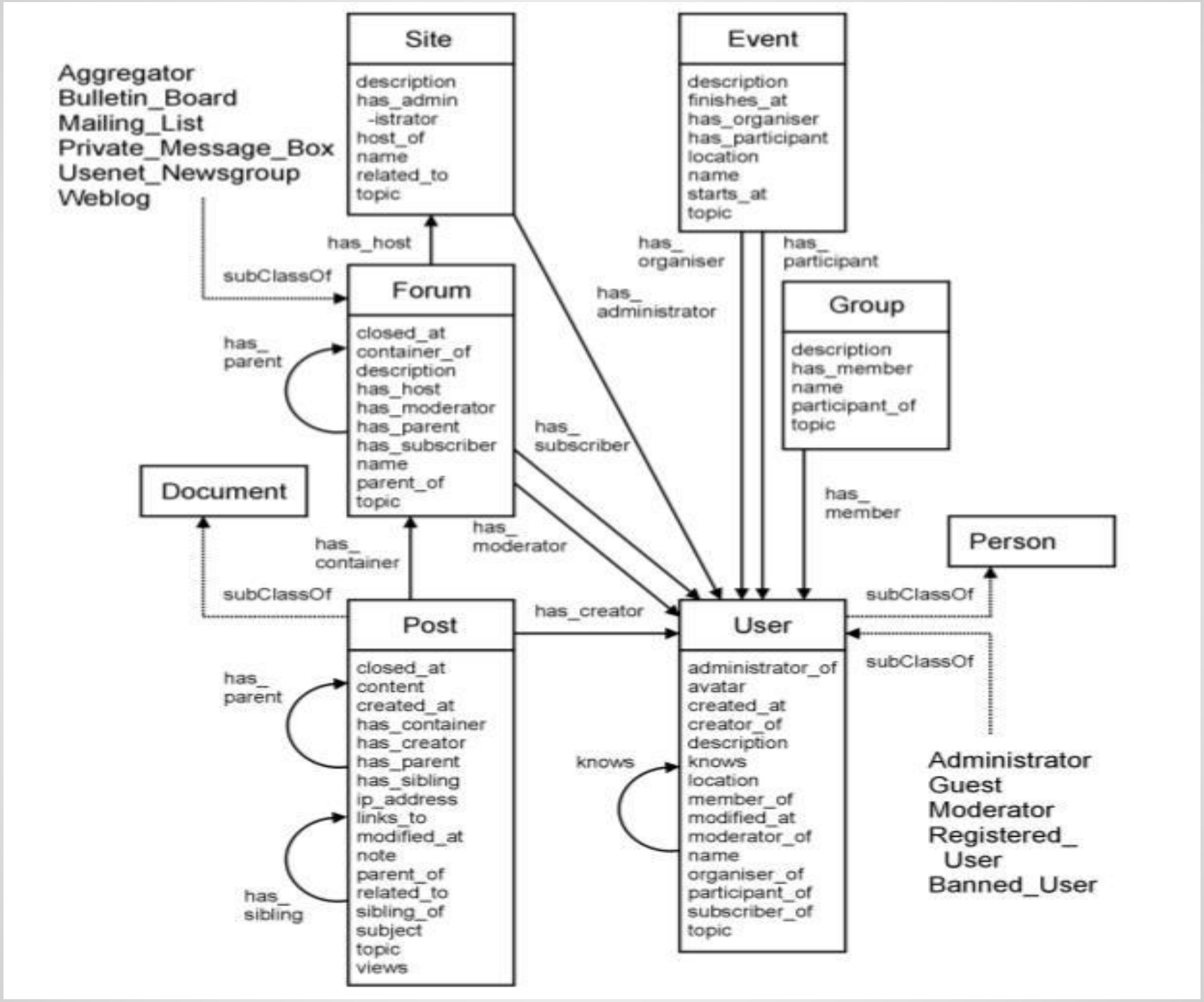
- **Main properties are;**
  - **topics**-definition applies to most of the classes defined above and it can act as metadata,
  - **views**-number of times the post has been viewed,
  - **has_sibling**-copy of another article in another forum,
  - **closed**-date and time of when a particular post or forum was closed,
  - **has_creator**-links post to a user profile,
  - **knows**-basic property to show the social structure in community sites.


Site
description
has_admin
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host_of
name
related_to
topic
Event
description
finishes_at
has_organiser
has_participant
location
name
starts_at
topic
Aggregator
Bulletin_Board
Mailing_List
Private_Message_Box
Usenet_Newsgroup
Weblog
has_host
subClassOf
Forum
closed_at
container_of
description
has_host
has_moderator
has_parent
has_subscriber
name
parent_of
topic
has_
parent
has_
organiser
has_
participant
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administrator
Group
description
has_member
name
participant_of
topic
has_
subscriber
Document
has_
container
has_
moderator
has_
member
Person
subClassOf
subClassOf
Post
has_creator
User
closed_at
content
created_at
has_container
has_creator
has_parent
has_sibling
ip_address
links_to
modified_at
note
parent_of
related_to
sibling_of
subject
topic
views
has_
parent
has_
sibling
knows
administrator_of
avatar
created_at
creator_of
description
knows
location
member_of
modified_at
moderator_of
name
organiser_of
participant_of
subscriber_of
topic
subClassOf
Administrator
Guest
Moderator
Registered_
User
Banned_User

FOAF

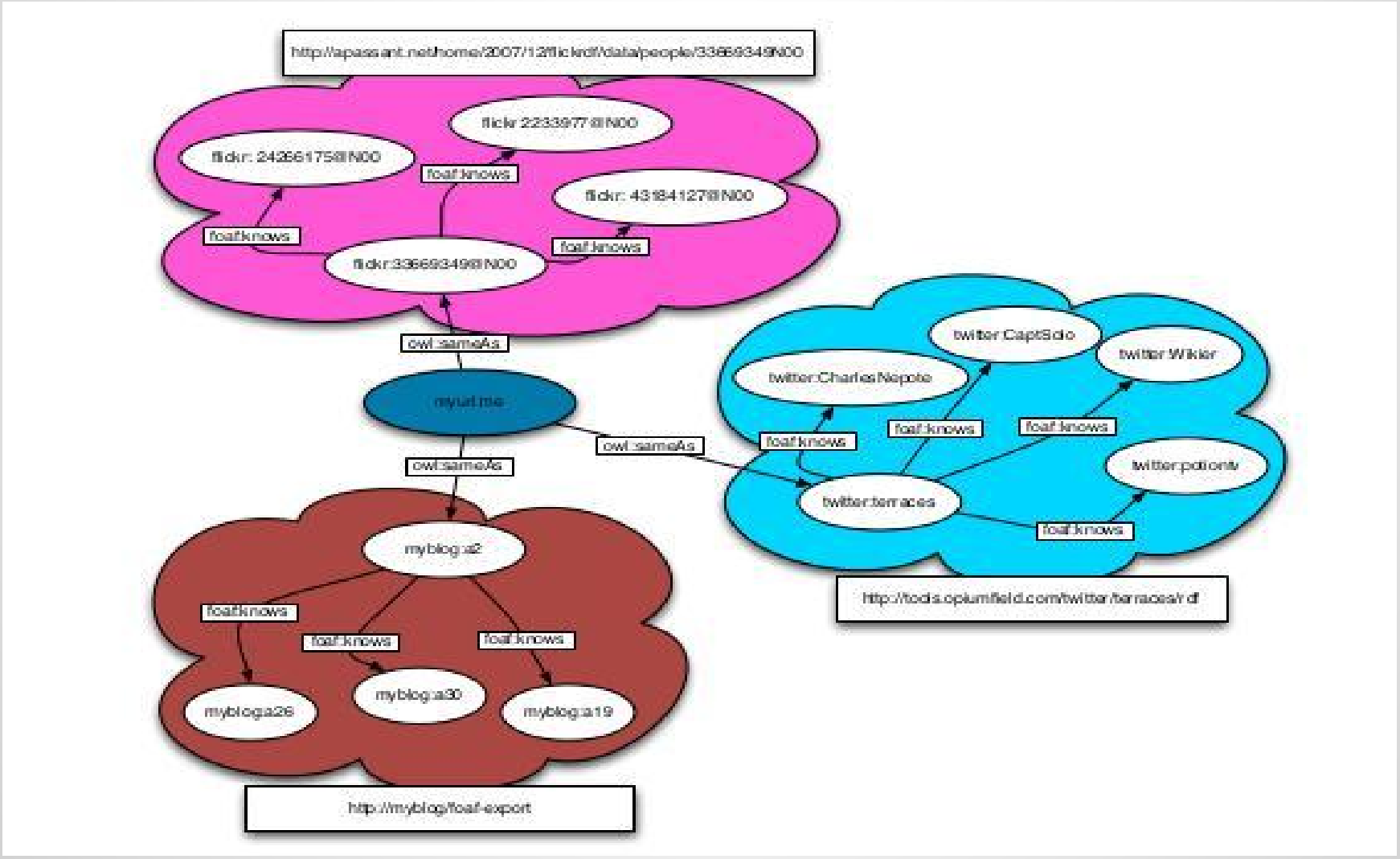
- FOAF : Friend Of A Friend
- Helps in modeling people and relationships
- Uses following principles to model
  - foaf:person:used to represent each person, may be assigned URI's
  - foaf:name, foaf:birthday
  - foaf:knows : people are related using this property.
- Example:

  flickr:33669349@N00 a foaf:Person ;

  foaf:name "Alexandre Passant" ;

  `foaf:mbox_sha1sum "528b95cc44060ceea571d7498a9fd2c7e3ca8a4c" .

Continued...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owl:sameAs
myurl:me
owl:sameAs
owl:sameAs
twitter:CaptSolo
twitter:Wikier
twitter:CharlesNepote
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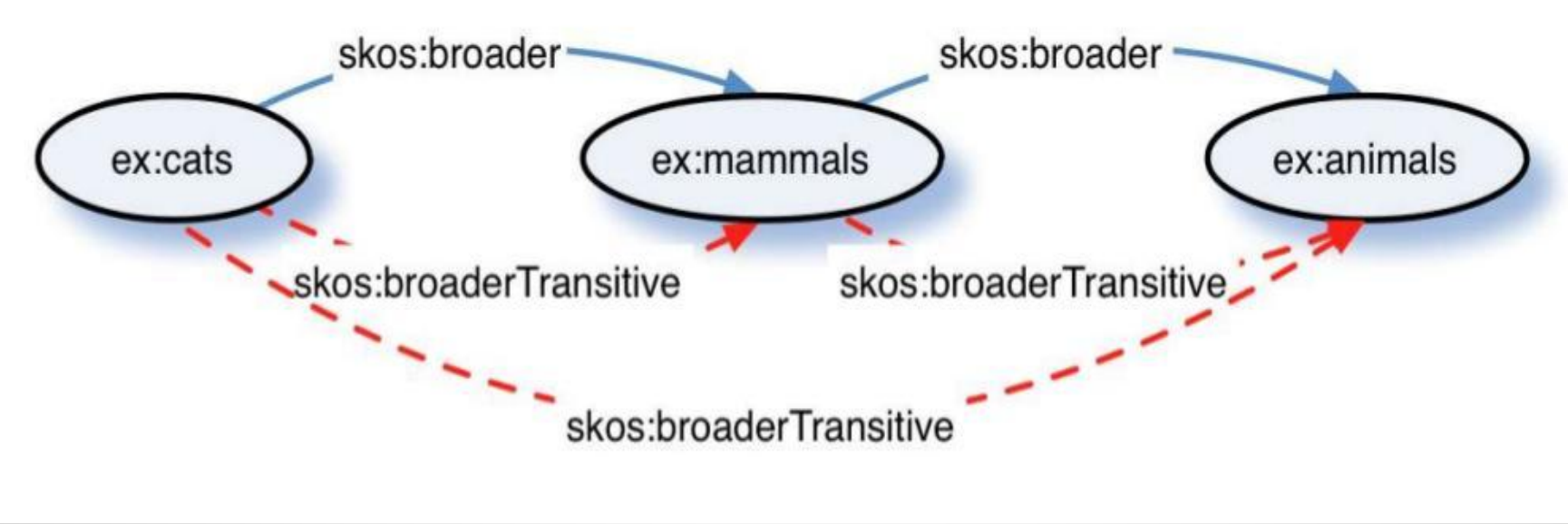
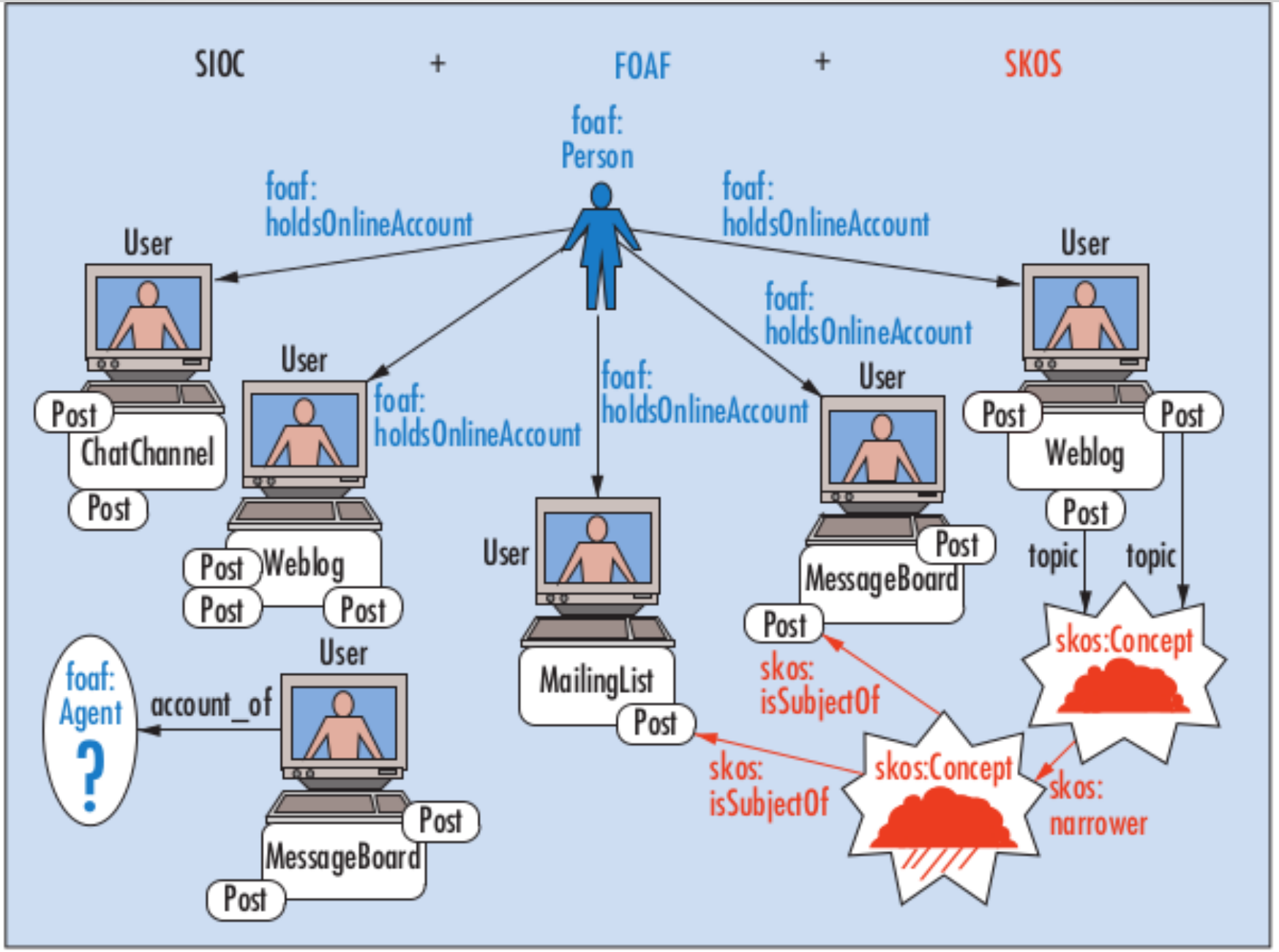
foaf:knows
twitter:potionv
twitter:terraces
foaf:knows
http://todis.opiumfield.com/twitter/terraces/rdf
myblog:a2
foaf:knows
foaf:knows
foaf:knows
myblog:a26
myblog:a30
myblog:a19
http://myblog/foaf-export

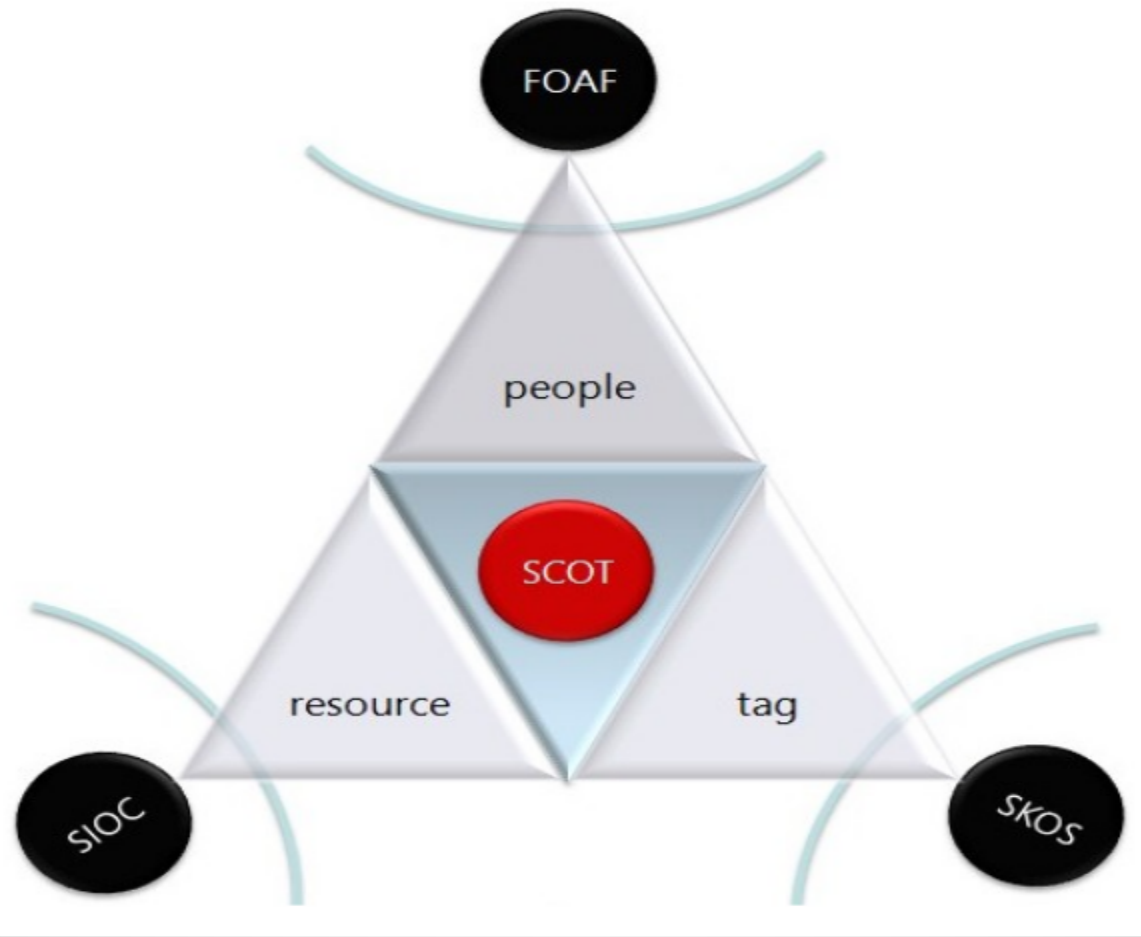
SKOS is concept based and not term based

skos:broader
skos:narrower
skos:related
skos:prefLabel




SIOC
+
FOAF
+
SKOS
foaf:
Person
foaf:
holdsOnlineAccount
foaf:
holdsOnlineAccount
foaf:
holdsOnlineAccount
foaf:
holdsOnlineAccount
foaf:
holdsOnlineAccount
User
User
User
User
User
Post
ChatChannel
Post
Post
Weblog
Post
Post
Post
Post
Weblog
Post
Post
Post
MessageBoard
Post
Post
MailingList
Post
topic
topic
skos:Concept
skos:
isSubjectOf
skos:
isSubjectOf
skos:Concept
skos:
narrower
foaf:
Agent
?
account_of
User
Post
MessageBoard
Post

SCOT :Social Semantic Cloud of Tags



Issues with SIOC?

- The grand challenge is adoption by community sites, i.e., how a critical mass can be reached by expecting users to make use of the SIOC ontology. By using concepts that can be easily understood by site administrators, and by providing properties that are automatically created by an end user, the SIOC ontology can be adopted in a useful way.
- A second challenge is how best to use SIOC with existing ontologies and collaboration technologies. This challenge can be partially solved by mappings and interfaces to commonly used ontologies, such as DC, FOAF and RSS and by wrappers to technologies such as SQL databases.

Future Scenario

- We expect SIOC to act as a “crystallization point” along with FOAF, DC, and SKOS in bringing various domain ontologies together to better describe user-generated content both on the Social Web and in enterprise environments. SIOC provides a framework to which we can attach further details about content items.
- SIOC Project is actively working and has already over 40 modules and applications. Some of which are SIOC explorer, SWPop and Engage.

For more details on applications and sioc go to their webste i.e.

http://sioc-project.org/

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[5] Isabel F. Cruz, Huiyong Xiao ”The Role of Ontologies in Data Integration” ADVIS Lab Department of Computer Science University of Illinois at Chicago,

Thank You.