Collaborative, Customizable Task Environments

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The Vision

- Mash-up applications and their data.
- Manipulated data pushed to all users.
- Derive novel information through combination and visualization.
- Language (?)
# Knowledge on the Web

<table>
<thead>
<tr>
<th>Social Web</th>
<th>Semantic Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>✴️ User collaboration</td>
<td></td>
</tr>
<tr>
<td>✴️ Flicker, Google Docs</td>
<td></td>
</tr>
<tr>
<td>✴️ Presented as HTML, data hidden behind APIs</td>
<td></td>
</tr>
<tr>
<td>✴️ Applications tend to be intuitive</td>
<td></td>
</tr>
<tr>
<td>✴️ Structured information</td>
<td></td>
</tr>
<tr>
<td>✴️ Usually generated by an administrator specific to a task.</td>
<td></td>
</tr>
<tr>
<td>✴️ Map information from one domain to another.</td>
<td></td>
</tr>
</tbody>
</table>
Collective Knowledge Systems

- User-generated content
- Static information is no good (Web 1.0, 90s)
- Human-Machine Synergy
- Bidirectional, each making up for the other’s weakness
Collective Knowledge Systems

- Scalability
  - log-log scale
- Emergent knowledge
- Deductive, inductive, abductive reasoning
Friendly Neighbor Approach

- Open up APIs and Databases for access
- Cooperation of site owners
- Business motivation required
Parser Approach

- Use proper names to identify entities
- Develop property or class assertions using "controlled" language
- Use extracted information to extend unstructured data
Data-Generating Tools

Approach

- Provide users generating content tools which automatically supply semantic information
Mashing Up Web 2.0 and the Semantic Web
This paper advocate a paradigm shift from an overly machine-centred AI view of the **Semantic Web** towards a more **user-** and **community centred** approach that draws from the insight of **Web 2.0**
Why?

- Semantic Web
  - Rich Technical Infrastructure for exchanging information across application boundaries
- Web 2.0
  - **Community:** Contributors collaborate and share information
  - **Interactivity:** Mashups and AJAX
Scenario

- Chrissie Blogs about movies
- Create a new entry
- Enters a title
- Write the text
- Tags
- Publish!

Everything pink - Chrissies blog

Pirates of the Caribbean 3
June 21st, 2007

I just went with Till into the last part of the Pirates of the Caribbean, where our heroes (the adoringly cute Orlando Bloom and Keira Knightly reprise their roles) go to the end of the world to save the one and only Captain Jack Sparrow (Johnny Depp! xOxOx!) from the claws of the Kraken. And guess what - Jack Sparrow's daddy has a special appearance, played by old Rolling Stone Keith Richards! Weeeeha!

Best movie of the year, until know, without a question! Tons of fun, and colorful action.

no comments yet – post your comment - backtrack
Imaginative Scenario: Smoov

- Reusing data from the Web
- To state that she is writing a movie review
- To identify the movies by title, actors, directors, IMDb, wikipedia
- The plug-in pulls some data about the movie
- Dynamic data sources
  - Dynamically show the showtimes
  - Dynamically show the DVD buying information

Who will provide the dynamic information???
CINEMAS!!!

BUT...

NEED TO ATTACH A SPARQL ENDPOINT TO THEIR DATABASE, OR WRITE A SIMPLE RDF EXPORTER BESIDES AN EXISTING HTML EXPORTER.
Chrissie’s rating and review would represent a contribution to the Semantic Web.
But...

The imaginative scenario is not realistic, since it assume significant background *infrastructure* that is not available today.
infrastructure

- Creation
  - What are the sources of semantic data?
  - existing applications
- Exchange
  - How can semantic data be distributed, gathered, and combined?
  - Mapping available data to a common established ontologies
- Reuse
  - How can semantic data be put to practical use?
  - Mashups

HYPOTHESIS: THE SEMANTIC WEB IS BUILT ON A DECENTRALIZED AND OPEN INFRASTRUCTURES THAT CAN FACILITATE DATA INTEROPERABILITY.
Suggested first steps

- Expressive Ontologies
  - Light-Weight Ontology
- Scalability and Tractability (Provenance)
- Usability
  - Intuitive usage
  - Collaborative construction of ontologies
- Trust and Control
- Mapping and Integration
Linking and Reusing Data in Web 2.0
Introduction

- Web 2.0 community application become popular
  - collaborative
  - “Object-centered sociality”
- Semantic Web offers infrastructure for interchange, integration and creative reuse of structured data
Background summary of related projects

- SIOC core ontology
- Microformats vs RDF
- APIs
- Structured and semantic blogging
SIOC ontology

Realm of web-based discussions

Web 2.0 Objects

Fig. 2. Main classes and properties in SIOC.
Vision

Fig. 3. Creating social networks via object-centred sociality.
Describe data from Web 2.0 sites with RDF

_:post1 a sioc_t:BlogPost ;
  ... content; other properties ...
  sioc:has_reply _:comment1 ;
  sioc:has_creator _:user1 .
_:comment1 a sioc_t:Comment ;
  ... content; other properties ...
  foaf:maker _:person2 .
_:person2 a foaf:Person ;
  foaf:name "Aidan Finn" ;
  foaf:homepage <http://www.aidanf.net/>

return a distinct set of values of names and (optionally) homepage URLs of all persons who have commented on posts created by _:user1

(a has_bookmarked url_1) and
(b has_bookmarked url_1)
=> (a is_related_to b)
Implementation of SIOC Type module

- Introduce subtypes of SIOC classes to extend core ontology
  - Precisely represent various elements of online community sites
    - e.g., soic_t:Comment is a subclass of soic:Post
  - Describe Web 2.0 objects in SIOC and Point to existing ontologies
    - e.g., a soic_t:ReviewArea may contain soic_t:Review(s)
Fig. 4. Container classes in SIOC Types and related content items which they may contain.
Example – representing

Table 1
Mapping between hReview and RDF vocabularies

<table>
<thead>
<tr>
<th>hReview field</th>
<th>RDF field(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>dc:title</td>
</tr>
<tr>
<td>Item type</td>
<td>Classes linked from SIOC Types</td>
</tr>
<tr>
<td>Item info</td>
<td>sioc:about</td>
</tr>
<tr>
<td>Reviewer</td>
<td>foaf:maker, foaf:Person, rev:reviewer</td>
</tr>
<tr>
<td>dreviewed</td>
<td>dctypes:created</td>
</tr>
<tr>
<td>Rating</td>
<td>rev:rating</td>
</tr>
<tr>
<td>Description</td>
<td>sioc:content, rev:text</td>
</tr>
<tr>
<td>Tags</td>
<td>sioc:topic</td>
</tr>
<tr>
<td>Permalink</td>
<td>sioc:link, URL</td>
</tr>
<tr>
<td>Licence</td>
<td>cc:license</td>
</tr>
</tbody>
</table>

Fig. 5. Describing a review (a) in hReview and (b) as linked RDF data.
Conclusion and future work

- Bridge Web 2.0 communities and Semantic Web
  - Open APIs and microformats: get structured information
  - Semantic Web technologies: offer infrastructure
- SIOC Type ontology module to brings together various vocabularies
- Explore better techniques for
  - describe combinations of RDF vocabularies to describe Web 2.0 objects
  - define concrete mappings from objects into RDF
Moving Forward
Possible Contributions

- Expressive Ontologies
- Provenance
- Improving Wiki Usability
- Trust and Policies
Possible Contributions

- Distributed SPARQL
  - Query multiple data sources, combine data for new, interesting applications
- Scalable data storage and reasoning
- How to work with billions of triples
Questions?
References

