Information Seeking in a Socio-Semantic Web Application

Jean-Pierre CAHIER, L’Hédi ZAHER
and Manuel ZACKLAD

ICD/ Tech-CICO Lab
(Technologies de la Coopération, de l’Innovation et du Changement Organisationnel)
Université de Technologie de Troyes (UTT) - France

“Pragmatic Web” International Conference (ICPW’07), Tilburg, The Netherlands, 22-23 oct. 2007
AGENDA

1) - « Socio-semantic Web » and the Hypertopic model

2) - How to help “Socio-semantic activity” within a community:

3) - Three methods, explored in real « Socio-semantic Web » applications (2002-2007):
   - 1) « centralized co-building » method
   - 2) « conflictual co-building » method
   - 3) « hybrid co-building » method

4) “Information Seeking” in these Socio-Semantic Web applications
« Socio-semantic Web » (2003) and the Hypertopic model (2002) are approaches mainly founded on CSCW, Knowledge Engineering, Knowledge Management and Social Sciences

« Socio Semantic Web [Zacklad et al., 2003]

- is a social Web which participates in the building of a structured representation of both the domain and the community
  - « Maps », pragmatic ontologies or shared indexes make the collective knowledge and activities both more visible and more reflexive (e.g. Web2.0)
  - incremental structuration of cognitive and social network
- is a Web which focuses communities
  - users following similar goals,
  - but: participating to sub-groups, accepting multiples social roles, competences, opinions, conflicts → diversity of points of view
- is supported by a model: Hypertopic. With Hypertopic, points of view are built by community members (not familiar with knowledge modelling) for embracing collections of items (e.g. items are products, projects, persons, learning objects...)
  → multiples Dimensions of Analysis (consensual plurality)
  → multiples Opinions or Points of View (conflictual plurality)

Socio-semantic Web is a « pragmatic Web », oriented towards the « socio-semantic activity » of Community’ members
an « Hypertopic » map includes multiples points of view:

**Hypertopic is**

1) a knowledge representation (a set of basic constructs which are the « keys » of the map ») to co-build and communicate (discussions, design issues...) about the map

2) a protocol providing a standard access to « map services »

*Hypertopic Map for the community in its domain*

- hundreds of items (item = a R&D project) and actors (e.g. contributors for R&D projects)
- 7 points of view corresponding to different business « languages » in the organisation
- 1500 topics after 2 months
- thousands of documentary resources

*1 Hypertopic* = a multi-points of view topic map, to consider items = a « semiotic ontology »

*e.g. the « Agora/France-Telecom » application (2002) followed Hypertopic and was built using a « knowledge-based marketplace » (KBM) cooperation model [Cahier, 2002]*

- items
e.g. the « Agora/France-Telecom » application (2002), followed Hypertopic and was built using a « knowledge-based marketplace » (KBM) cooperation model [Cahier, 2002]
- hundreds of items (item = a R&D project) and actors (e.g. contributors for R&D projects)
- 7 points of view corresponding to different business « languages » in the organisation
- 1500 topics after 2 months
- thousands of documentary resources
e.g. the « Agora/France-Telecom » application (2002), followed Hypertopic and was built using a « knowledge-based marketplace » (KBM) cooperation model [Cahier, 2002]

- hundreds of items (item = a R&D project) and actors (e.g. contributors for R&D projects)
- 7 points of view corresponding to different business « languages » in the organisation
- 1500 topics after 2 months
- thousands of documentary resources
The complete Hypertopic model includes also attributes and resources.

HYPERTOPIC is the knowledge representation (a « metasemiotic ») that the actors need to use, in order to co-construct, to discuss, etc., the collective map.
Hypertopic

Point of View: concurrent characterisations of the item

Item: identifier of the situation / of the artefact object of the inquiry
Hypertopic

**Point of View:** concurrent characterisations of the item

**Topics:**
- heuristic thematization of the item

**Item:** identifier of the situation / of the artefact object of the inquiry
Correlation A

Topics:
heuristic thematization of the item

Point of View: concurrent caracterisations of the item

Item: identifier of the situation / of the artefact object of the inquiry

Standard attributes:
referential specification of the item

Hypertopic
Hypertopic

Point of View: concurrent characterisations of the item

Correlation A

3 Topics:
heuristic thematization
of the item

Item: identifier of the situation /
of the artefact object of the inquiry

Correlation B

Standard attributes:
referential specification
of the item

Correlation C

Resources:
Documentation of the item
Hypertopic model (UML representation)

Remarks:
- The model is made to be understood by the community which use it to co-build the map;
- Hypertopic is focused exclusively on a very few basic constructs (certain are inspired by the TM), for methodological reasons: to give to many end-users the ability to edit the map (items, topics) without any particular training, it is necessary to more constrain the TM language to fix the usage makes easier to deploy the co-building within large communities.
Hypertopic technical context

- Standardization
  - 2006 : XML Schema and standard protocol (cf. www.hypertopic.org)
  - bridges with Topic Map (XTM), W3C Semantic Web standards…
- Tools
  Yet several open-source tools address the « Socio Semantic Web » by using the Hypertopic model.
  - Argos-viewpoint server (http://sourceforge.net/projects/argos-viewpoint/) a repository for all topic maps following the Hypertopic format
  - Porphyry (http://www.porphyry.org/) a « plug-in » with advanced functions
  - Cassandre, a CAGDAS (Content Analysis Software) tool for applications in social sciences to build, compare, and exchange qualitative analyses of textual materials (http://sourceforge.net/projects/cassandre-qda/)
  - Agoræ (http://sourceforge.net/projects/agora), a thin Hypertopic client:
    - basic groupware functions and standard roles to edit (create, modify) an Hypertopic map by many distant users;
    - better methods, customizable procedures, roles design and roles taking to co-build the maps
    - means to annotate nodes of the map (« post-it »-like messages), in order to facilitate discussions between users;
    - graphical solutions helping to visualize, to trace actions and to compare maps;
  - CitizenMiles (http://www.blueinitiative.com) : attribution by community members of « Miles » (points, votes, Euros…) to items. Miles are special Hypertopic attributes allowing to evaluate or to support items (leading to use Hypertopic applications as collective decision support systems)
But how to collectively construct and maintain an Hypertopic map ( = « socio-semantic activity”)?

*It is useful to distinguish:*

- a « bootstrapping » phase
  - to define the item, to define the first set of « points of view»
  - based (eventually) on folksonomies or on the confrontation of actors’ personal « design maps »
  - leading (eventually) to a « synthesis map » usable by the group
- a phase of maintenance / evolution of the map

*Methods explored to co-build Hypertopic maps in the two phases are many, we’ll give 3 examples*

*But before that : How to articulate the activity model with the knowledge representation model ?*
How to articulate the models required for co-building Hypertopic maps?

HYPERTOPIC
Model for knowledge representation within the Socio Semantic Web

Basic roles to edit the map, e.g.:
- Tagger (propose tags, indexes items)
- Contributor (edits/indexes items)
- Semantic editor (edits/associates topics)

+ informal roles: discussion, annotations…
for each Hypertopic map node

Map of the domain for the Actor 1
Map of the domain for the Actor 2
Hypertopic Map for the community in the domain

“co-building” method?

The « socio-semantic activity » methodological challenge

“co-building” participative method?

instrumented activity model?

knowledge representation
The « socio-semantic activity » methodological challenge

- To co-build maps by users themselves is a complex challenge.
- Often it is necessary to let the community imagine its own architecture of cooperation and its socio-semantic activity (« participatory design » approach). Users need to dynamically adapt their specific social roles.
- Easy-to-read and flexible diagrams for roles, activity…are needed to improve users’ participation and facilitation.
- UML, SADT… diagrams are too formal and « IT-specialists » oriented. They don’t support vagueness / incompleteness.
- Emphasis on CSCW studies, i.e. Role-Mechanisms [HERRMANN 04]: role assignment, role taking, role change, role definition, role making, Inter-role conflict, etc.
- We choose the sociotechnical “SEEME” method [HERRMANN 99] to complete Hypertopic.

SeeMe diagrams editor, Seeme tutorial:
http://web-imtm.iaw.ruhr-uni-bochum.de/iug/projekte/seeme/installer/index.html
http://web-imtm.iaw.ruhr-uni-bochum.de/iug/projekte/seeme/
Methods explored to co-build Hypertopic maps:

- 1) «Centralized» method (distance or presence workshops) → with a facilitator role, who assists the emergence (and finally decides) of a consensual set of points of view.
- 2) “Conflictual co-building method”, to make the conflicts more explicit.
- 3) «Hybrid» method associating «top-down» «centralized» method and «bottom-up» folksonomies.
1) The « centralized co-building » method
(with a facilitator - *was used in the « Agora/France-Telecom » case*)

SeeMe notation for roles

SeeMe notation for activities

Facilitator

Bootstraps the map with a "mono-designer" method
1) The « centralized co-building » method

SeeMe notation for roles

Facilitator

Bootsstraps the map with a "mono-designer" method

SeeMe notation for activities

Web Resources

Hypertopic Map

Items

Topics

Points of view

SeeMe notation for entities
1) The « centralized co-building » method
1) The « centralized co-building » method
1) The « centralized co-building » method
1) The « centralized co-building » method
2) the “conflictual co-building” method
(without facilitator)

Hypertopic accepts multiples points of view:

- multiples Opinions or Points of View (conflictual plurality)
- multiples Dimensions of Analysis within each particular Point of View
2) the “conflictual co-building” method

« Bootstrap » phase

Map of the domain for the Actor A
Map of the domain for the Actor B
Map for the community in the domain

Point of view 1
Point of view 2
Point of view 3

items

topics

items

items

item

item

item

«conflictual co-building” method
2) the “conflictual co-building” method

« design maps » from each actor
2) the “conflictual co-building” method
2) SeeMe representation of the “conflictual co-building” method
2) SeeMe representation of the “conflictual co-building” method
2) SeeMe representation of the “conflictual co-building” method
2) **SeeMe representation of the “conflictual co-building” method**

![Diagram showing a community with sub-groups of members participating in the bootstrap process.](Image)
2) SeeMe representation of the “conflictual co-building” method
2) SeeMe representation of the “conflictual co-building” method

was used in the « DKN-SEQXAM » case
3) « hybrid » co-building method with Agoræ
(presently used in the « Initiatives-21 » case: a « e-catalog » of projects and initiatives in the field of sustainable development)
3) « hybrid » co-building method with Agoræ
(presently used in the « Initiatives-21 » case: a « e-catalog » of projects and initiatives in the field of sustainable development)
3) « hybrid » co-building method with Agoræ
(presently used in the « Initiatives-21 » case: a « e-catalog » of projects and initiatives in the field of sustainable development)
3) « hybrid » co-building method with Agoræ
(presently used in the « Initiatives-21 » case: a « e-catalog » of projects and initiatives in the field of sustainable development)
3) « hybrid » co-building method with Agoræ
(presently used in the « Initiatives-21 » case: a « e-catalog » of projects and initiatives in the field of sustainable development)
3) « hybrid » co-building method with Agoræ
(presently used in the « Initiatives-21 » case: a « e-catalog » of projects and initiatives in the field of sustainable development)
La brique verte

Fiche descriptive

- Description : Réduction intelligente des jeux Lego inutilisés
- Lancement : 2007
- Localisation : Troyes

Ressource(s) documentaire(s)

- Revue de presse
- Site Web

Effets du projet

• Effets environnementaux
• Effets symboliques
• Effets Sociaux
• Effets économiques
• Contre-effets

Projets à voir

Sibylline, Île aux Oiseaux, Tigres en Inde,
Mangrove Ouest, Cansino, Campus responsables,
Cartosolid, Clem, Ally Eoliennes,
EauSecours, La brique verte, Blouses roses, Le brique

Recherche

Campagne Ardennes

Effets Sociaux

Effets symboliques

Le paysage

Réduction ou diminution de consommation
Sécurité alimentaire
Equipements déployés sur le terrain

Effets du projet

- Effets environnementaux
- Effets symboliques
- Effets Sociaux
- Effets économiques
- Contre-effets

Projets à voir

- Sibylline
- Ile aux Oiseaux
- Tigres en Inde
- Mangrove Ouest
- Cansino
- Campus responsables
- Cartosolid
- Clem
- Ally Eoliennes
- EauSecours
- La brique verte
- Blouses roses
- La brique verte
- Biomass
- La Brique Verte
- Lait-AlimenTerre
- Lozere-pilote
Effets environnementaux

- Biodiversité
- déforestation
- réduction ou optimisation de consommation
- recyclage
- dépollution
- énergies renouvelables
- eau

Projet(s) Pertinent(s)

Sibylle  Ile aux Oiseaux
Mangrove Ouest  Canino
Cartosolid  Clem  Ally  Eoliennes  EauSecours

Champagne-Ardenne  France
- animaux marins  déforestation
  - eau  eoliennes  oiseaux
  - oiseaux de mer
  - recyclage  réduction
  ou optimisation de consommation d'énergie  tigres  équipements déployés sur le terrain
Information Seeking in a Socio-Semantic Web Application

uses all Hypertopic concepts: points of view,
Information Seeking in a Socio-Semantic Web Application

uses all Hypertopic concepts: points of view, topics

- Biodiversité
- déforestation
- réduction ou optimisation de consommation
- recyclage
- dépollution
- énergies renouvelables
- eau

Sibylline Ile aux Oiseaux Mangrove Ouest, Cansino Campus responsables: Cartosolid Clem Ally Eoliennes EauSecours

- recyclage • réduction ou optimisation de consommation d'énergie • tiges • équipements déployés sur le terrain •
Information Seeking in a Socio-Semantic Web Application

uses all Hypertopic concepts: points of view, topics, items.
Information Seeking in a Socio-Semantic Web Application

uses all Hypertopic concepts: points of view, topics, items, attributes
Information Seeking in a Socio-Semantic Web Application

uses all Hypertopic concepts: points of view, topics, items, attributes, resources
Information Seeking in a Socio-Semantic Web Application uses all Hypertopic concepts: points of view, topics, items, attributes, resources, and possibility to build the map within the inquiry activity.
Information Seeking in a Socio-Semantic Web Application

uses all Hypertopic concepts: points of view, topics, items, attributes, resources, and possibility to build the map within the inquiry activity
References


Questions?

- **Démo Agorae V1 / DKN SEQXAM**: (conflictual co-building)
  http://tech-web-n2.utt.fr/dkn

- **Démo Agorae V2 / CartoDD-Initiatives 21**: (hybrid method)
  http://tech-web-n2.utt.fr/dd/

- **Slides of the present presentation can be downloaded (next thursday)** on:
  http://cahier.tech-cico.fr/docs/icpw07.pdf
Annexes
Mock-up for CartoDD
(derived from www.buzzillions.com)
Hypertopic

Point of View: concurrent characterisations of the item

Correlation A

Topics: heuristic thematization of the item

Item: identifier of the situation / of the artefact object of the inquiry

Standard attributes: referential specification of the item

Resources: Documentation of the item

Correlation B

Correlation C

1

2

3

4

5
56

Points of View

Semiotic ontology

Information seeking with Hypertopic

Topics and tags

Standard Attributes
(including Citizen Miles Attribution)

Doc. Resources