Online Community Mapping

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Last Year: we try to understand 4 dimensions in Web-based community GIS.

Four dimensions

- Spatial data sources
- Web technologies
- People and Community
- Sustainability
At this point in time: we can say with confidence that **people, place, participation** are emerging in
Content for Today:

① What Phenomenon
② Supporting Theories
③ A Proposed Model
④ Supporting Technologies
⑤ Geospatial Legal Aspects
⑥ Conclusion
What Phenomenon is sweeping the Internet?

- Interaction
- Convergence
- Geographical
- Personal participation
- Web-based
What Phenomenon is sweeping the Internet?

2003~2004: **Online Map Usage** has increased 60% world wide (Nielsen NetRatings, October 2004)


2005/ US: After **Google Map** release… a proliferation of online map websites… "This is like the 1990's, when everyone was creating everything on the Web." (NYTimes, October 20, 2005)

2005/ UK: Data supplied by **Ordnance Survey (OS)** adds an annual value of more than £100bn to the **UK economy**. (Guardian, April 7, 2005)
We trace the emergence of specific features: see appendix I
2. Supporting Theories

In conceptualizing the making of Online Community Mapping (OCM), we draw on the theoretical perspectives of

- Naïve Geography
- Participatory Research
- Online Community Framework (OCF)
a multidisciplinary research which is involved at least geography, sociology & information/computer science

see appendix II
In theory, naïve geography stress

<table>
<thead>
<tr>
<th>Top-down approach</th>
<th>Authority-generated data</th>
<th>Community-generated data</th>
</tr>
</thead>
<tbody>
<tr>
<td>■ common-sense geography of the world</td>
<td>■ allow “errors” &amp; “inconsistent”</td>
<td>■ next-generation GIS theory base</td>
</tr>
</tbody>
</table>
classify a diverse collection of these phenomena

<table>
<thead>
<tr>
<th>On-line community</th>
<th>Off-line community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top-down approach</td>
<td>Bottom-up approach</td>
</tr>
<tr>
<td>Authority-generated data</td>
<td>Community-generated data</td>
</tr>
</tbody>
</table>

OpenSource GIS
EnterpriseWeb GIS
Standalone GIS

Chuang and Huang, 2005
In theory, social geography focuses on the relationships between people and place.

Among these, participatory research offers a model of community development.
issues to understand geo-spatial mapping

Online Mapping

Projects/Activities

Community Mapping

Projects/Activities

Authority-generated data

Community-generated data

OpenSource GIS

EnterpriseWeb GIS

Standalone GIS

On-line community

Off-line community

Chuang and Huang, 2005
examples to understand geo-spatial mapping

- TSM
- CMAP
- Window to My Environment
- Ordance Survey
- TIGER
- Community Atlas
- Community Mapping Network
- NSDI
- OpenStreetMap
- Blogmapper
- FreeGIS
- ProjectOneMap
- CHiRP
- GeoURL
- UpMyStreet
- Google
- Yahoo
- MSN
- Map
- NSDI

On-line community

Off-line community

Authority-generated data

Community-generated data
3. A Proposed Model
A Proposed Model

for a common-sense geography of the world

Chuang and Huang, 2005
**online collaborative communities**: popularity of online communities is increasing which based around bloggers, wikis,…

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Chuang and Huang, 2005
participatory community mapping: providing participants an approach to their self-representation, a systematic process for identifying capacities and barriers, as well as serving as a resource for mobilizing community opportunities.
A Proposed Model

Chuang and Huang, 2005
Therefore we define *online community mapping*:

The process of collaborative mapping of geo-spatial domains where people participate online.
But, What are the Enabling Factors in Collaborative Geo-spatial Mapping?

for collaboration & social interaction

public geo-spatial datasets & software tools

Chuang and Huang, 2005
4. Supporting Technologies

“Web technologies are beginning to enable users to more beyond the role of passive receivers to become active participants in collaborative information flows.”

(Rogers. N., 2003)
In our experience,
Geography Markup Language (GML) and Scalable Vector Graphics (SVG) well utilize existing open source resources.
Taiwan Population Mapping
(http://tsm.iis.sinica.edu.tw/)

Taipei City GML-based Interoperable Geo-spatial Systems

map rendering in SVG

Topographical map rendering in SVG and GML

Chuang and Huang, 2005
eg. SVG can be used to assist existing web mapping applications

UK hacker: Using SVG for paths in Google Maps

Google Maps API uses VML

SVG shares a lot in common with VML

http://jibbering.com/blog/?p=179

Chuang and Huang, 2005
Theoretically Speaking,

OCF

focus on 2 dimensions of **usability** & **sociability** in which to understand how **technology** *may or must* be used to improve them.

the emerging of **social software** may play a key role in the trend.
Social Software

- for document creation (wiki)
- personal publishing and syndication (blog)
- social bookmark for links sharing (del.icio.us)
- photo sharing (fliker)
- social tagging (technorati)
- resource sharing (BitTorrent)

Chuang and Huang, 2005
a well-mixed bowl of collaborative software
groupware
social computing
computer supported cooperative work (CSCW)

wikipedia.org/wiki/Social_software
powerful tools for facilitating social communication, creating and maintaining online communities

participatory democracy
participatory media

blog
wiki

open, simple and freely editability
who are combing social software to geo-place

Examples of (geo + blog) / (geo + wiki), see appendix III

Chuang and Huang, 2005
Why people want to tie social software to geo-place?
In theory, participatory research

**Mapping** is one of the best participatory techniques. It also offers participants a way to their self-representation. Tool for interrelationship Contribute to community projects Capacity building
Also because their mechanism design

1. eliminate technical barriers
2. make the Web accessible as a medium for self expression and offer two-way channels to communicate with.

<table>
<thead>
<tr>
<th>parallel system design between Wiki and Blog</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Syndication</strong></td>
</tr>
<tr>
<td><strong>Search/Track</strong></td>
</tr>
<tr>
<td><strong>Category/Aggregation</strong></td>
</tr>
</tbody>
</table>

Chuang and Huang 2005
1. **Permalink**: makes cross referencing and discourse easier

2. **Trackback**: automates cross blog referencing; converse and keeps correspondence explicit and persistent.

3. **RSS and Atom**, enables easy syndication and aggregation of blog content.

4. **Content**: excellent knowledge management tools
geo-spatial data
complex
sophisticated set of tools
mostly text-based

Chuang and Huang, 2005
Collaborative geo-spatial mapping technology = GIT + Social Software

Participation

People

Place

Authority-generated data

Community-generated data

On-line community

Off-line community

OpenSource GIS

EnterpriseWeb GIS

Standalone GIS

Chuang and Huang, 2005
5. Geospatial Legal Aspects

IT + Web

demand for access to a variety of geo data

have not kept pace with developments

data dissemination and licensing frameworks

Chuang and Huang, 2005
most major mapping agencies copyright their geodata, except for the US, CAN, Brazil, AUS, and NZ
Whether Governments Have the Right to \textit{Limit} and \textit{Charge} for State-Collected GeoData?
We accept the challenge to answer this question by analysing pro/con issues of arguments in particular.

See appendix IV

Chuang and Huang, 2005
Our perspectives

- online, open, and collaborative exploration of domain spaces is one of the most successful web paradigms.
- we advocate more flexible licensing models: CC, GPL or dual licensing (see Dr. Chuang’s presentation this morning)
- geo-spatial dataset release should be in source forms
- and should be accompanied by the necessary data models (i.e., schema), metadata and catalog descriptions, data format definitions, and source code of the related software tools.
6. Conclusion
This is a start toward bringing up many of these issues, and

As we widen our examples and perspectives, more and more new issues crop up.

At least,
While these are emerging, and can be found…
open/ collaborative geo-spatial mapping is boosting the phenomenon...
Conceptualization of Online Community Mapping

Chuang and Huang (2005)
Comment?
Criticism?
Challenge?

…. or
... Cheers!
APPENDIX
This research is the key underpinning for new emerging trends in the domain of Geo-Spatial Information Sciences that link information to users of that information integrated elements embedded “where, when, who, why, and write” to link “people, place, and participation”.

For these reasons, we expect this research to be a major innovation – with many unforeseen applications, as well as scientific and social consequences in a potential research manner among a wide range of disciplines.
Appendix I: 
trace the emergence of specific features

- online community
- community mapping
- online mapping
Online Community
Online Community Mapping

However, no universally accepted definition of community in complex networks!

Online Community = Online Data Users = Online Data Contributors

Online Users contribute their data/information they are exploring

Shared Data/Information Space

Authority-generated Community-generated data/information

Chuang and Huang, 2005
In the blog scenario, it means….

Google undertook Blogger.Blogger (a popular create-your-own-Web-diary software).

Coined the term “Moblogging”:
Adam Greenfield

The 1st posted Moblogging:
Stuart Woodward on LiveJournal

Blogging: boost
Coined the term “weblog”:
John Barger, Chicago: Robot Wisdom site

The 1st weblog:
Tim Bernes-Lee: http://info.cern.ch

1992
1997
1999
2001
2002
2003

Authority-generated

Community-generated data/information

Common + Interest

Blog / Website

Relationship + Hyperlinks

A community as a set of blogs

Chuang and Huang, 2005
In statistics, it means....

5/26/2005

- more than the 10-11 million have been indexed
- more than the 31.6 million hosted blogs
- BlogHerald's estimate of 60 million.

<table>
<thead>
<tr>
<th>Year</th>
<th>Hosted Blogs Created</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>136,000</td>
<td>-</td>
</tr>
<tr>
<td>2001</td>
<td>958,000</td>
<td>606%</td>
</tr>
<tr>
<td>2002</td>
<td>2,160,000</td>
<td>126%</td>
</tr>
<tr>
<td>2003</td>
<td>5,010,000</td>
<td>131%</td>
</tr>
<tr>
<td>2004</td>
<td>10,300,000</td>
<td>105%</td>
</tr>
</tbody>
</table>

Source: http://www.perseus.com/blogsurvey/

Google undertook Blogger (a popular create-your-own-Web-diary software)

Coined the term "Moblogging" Adam Greenfield

The 1st weblog: Tim Berners-Lee: http://info.cern.ch

1992

The 1st posted Moblogging: Stuart Woodward on LiveJournal

Blogging: boost 1999

Coined the term "weblog" John Barger, Chicago: Robot Wisdom site

2002

2003

2004
In the wiki scenario, it means….

Most wikis are open to the general public, and data most produced by the interested communities.

The Los Angeles Times experimented with using a wiki in the editorial section but failed.

Jimmy Wales/Wikimedia Foundation

Socialtext: the 1st commercial open source wiki

Jimbo Wales & Larry Sanger build Wikipedia

Established by Ward Cunningham

Ward Cunningham

enables documents to be written collectively (co-authoring)
In statistics, it means....

The case of wikipedia

- 50 million hits per day
- over 793,000 articles
- English-language articles over half a million
- about 40,000 people have contributed content to Wikipedia
- more than 100 language versions
Community Mapping

What is community mapping?

“It is a process which identifies the location of social, economic and ecological assets and deficiencies of a community.”


Chuang and Huang, 2005
Projects that use maps, geo-information, information technologies to build geo-spatial representations of **local knowledge**, facilitate **public participation**, help the public more informed **decision-making**, improve **planning process**, open up local project **opportunities**.

A survey of the current GIS literature reveals the following similar terms used to describe community-based GIS Applications (Peter A. Kwaku Kyem, 2004): **Public Participation GIS** (**PPGIS**), **Participatory GIS** (**PGIS**), **Community Integrated GIS** (**CiGIS**), Neighborhood-created GIS, Community Mapping.
Abundant projects/show cases:

✓ PPGIS - Public Participation GIS (see Dr. Tsai’s last presentation)
✓ Community Mapping – (New York, the Community Mapping Assistance Project (CMAP)

### Most recent 2005 publications...

- McCall, Michael K. (2005) *Mapping lost homes*, GIS@ development (Asian GIS Monthly) 9 (6) 24-27 Keywords: post-disaster, children, neighbourhood mapping, P-mapping, (Sri Lanka)
- Federica Burini. *La cartographie participative dans la recherche de terrains de villages riverains au Parc Regional W*, IUCN, in press
- E. Casti, Un modèle de Zonation participatif pour la périphérie du Parc National du Parc Matsamo, special edition: IUCN, in press

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Chuang and Huang, 2005

www.iapad.org/bibliography.htm
Online Mapping

1993 Xerox ParcMap
1995 MapQuest
2005 Google (Map/Earth), Yahoo, Microsoft, ...
major **search engine players** initiating street-level web map services for general public applications such as transportation, real estate, and local search
“significantly elevated public awareness that maps can be useful and fun.”

(Reed, C, 2005)
let the public/non-experts develop maps online with points on top

<table>
<thead>
<tr>
<th></th>
<th>Google</th>
<th>Yahoo</th>
<th>Microsoft/MSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satellite</td>
<td>Google Earth-10 meg download</td>
<td></td>
<td>Virtual Earth- no download required</td>
</tr>
<tr>
<td>Interactivity &amp; flexibility</td>
<td></td>
<td>Google &gt; Yahoo</td>
<td>older satellite imagery but at a higher resolution than Google</td>
</tr>
<tr>
<td>Quality ranking of mapping services</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Search power</td>
<td></td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Autolocate via your IP address</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Data suppliers</td>
<td>NavTech</td>
<td>NavTech</td>
<td>NavTech USGS</td>
</tr>
<tr>
<td></td>
<td>people believe Google Maps is more reliable because of its user interface.</td>
<td></td>
<td>VirtualEarth is aware of landmarks / neighbourhoods.</td>
</tr>
</tbody>
</table>
Appendix II:
take a look at the supporting theories

- naïve geography
- participatory research
- online community framework
“The body of knowledge that people have about the surrounding geographic world.”

Egenhofer and Mark, 1995

Notion of Naïve Geography

1) common-sense geography of the world
2) next-generation GIS theory base
3) core = spatial + temporal reasoning
4) qualitative reasoning method
5) allow “errors” & “inconsistent”

Chuang and Huang, 2005
People use multiple conceptualization of geo-space.

- Space + Time
- Distance = asymmetric, local ≠ global, don't add up easily
- Direction = NS/WE
- Topology matters, Metric refines
- Boundaries = entities
- Space 2D
- Earth flat
- MAP > experience
- Geo-entities ≠ table-top objects
- Geo-information = incomplete

Geo-space has multiple levels of details.
In theory, social geography focuses on the relationships between **people** and **place**. Among these, participatory research offers a model of community development.

Rachel, Pain (2004), Social geography: participatory research, in *Progress in Human Geography*, vol. 28, no.5, pp.652-663

Online Community Mapping

Chuang and Huang, 2005
In the words of Rachel Pain, “(narrative authority) gives traditionally powerless groups the power to shape the way their identities”
Online Community Framework (OCF)

de Souza, C.S. & Preece, J (2004),
A framework for analysing and understanding online communities,
*Interacting with Computers* 16:579-610

Chuang and Huang, 2005
Components & factors of the OCM framework

<table>
<thead>
<tr>
<th>people</th>
<th>software</th>
</tr>
</thead>
<tbody>
<tr>
<td>purpose</td>
<td></td>
</tr>
<tr>
<td>policies</td>
<td></td>
</tr>
</tbody>
</table>

sociability

social interaction in the online community

usability

what happens at the human-computer interface

Revised from

de Souza, C.S. & Preece, J (2004), p580

Chuang and Huang, 2005
Purpose of OCF-based analyses

1. To understand how technology **may or must** be used to improve usability & sociability.

2. To prevent problems in computer-mediated communication & social interaction.
Appendix III:
who are combing social software
to geo-place
UK Case: **UpMyStreet** Conversations

Coates, Webb & Magdalinski (2003) observed:

1. Geocoded community = Geocoded Message board (learn from *metafilter*, a weblog-style message-board)
2. Every threaded conversation has a specific geographical location.
3. Designed to help you “meet your neighbors and discuss local issues”.

Chuang and Huang, 2005
My profile: postcode geocoded

Conversation Nearby

Conversations History

Chuang and Huang, 2005
“Threads are not lost, people can see when things change.”


Here comes the fun part: Thread-tracking

Chuang and Huang, 2005
The WorldKit Projects

Chuang and Huang, 2005

http://brainoff.com/worldkit/examples.php
www.blogmapper.com/
The Fun Part is map-out your own interest
Some Other Wiki Mapping Ways

http://www.geowiki.co.uk/geowiki/
Some Other Wiki Mapping Ways

Welcome to the experimental setup of wikimaps, a project to generated map images from wiki-based data.

- If you’re using Firefox, take a look at how to SVG-enable Firefox
- See the Documentation for syntax description
- See Meta for more information.
- See Germany and South america for demonstrations. There are also other examples at the bottom of this page that shows Wikipedia connections.
- There is also a todo page

Available map data:
- germany
  - germany.bavaria
    - germany.bavaria.cities
  - germany.nnw
  - germany.mv
  - germany.bw
OpenSDI-the Open Spatial Data Infrastructure

Chris Holmes’s Wiki + OpenSDI

**BENEFITs**
- Trust mechanism
- How good data is

**BENEFIT**
- return searches based on what others rate as valuable

Wiki Like

eBay like

Slashdot Like

Google Like

Decentralized Geospatial web

Chuang and Huang, 2005
Thoughts

1. Wikipedia for base layer data
2. RSS + Spatial annotation
3. Annotated Tiger dataset:
   - Lets _anyone_ change the content – more users keeping things up
   - allow people to create their own community-based layers
4. Version Control idea:
   - A database records every single updates
   - (Subversion) this last thing is that it allows you to get the list of diffs on a zoomed in part of the map, that are the ones actually relevant for the part of the map you are looking at.
   - “History” section - just the numbers of the revisions by “wiki history GML application schema”/ special wiki transaction XML
"Because of the advantages in computing power, suddenly cartography has gone from a read-only medium into being a read/write medium."

says by Schuyler Erle, co-author of “Mapping Hacks”

Guardian April 7, 2005
Appendix IV: Whether Governments Have the Right to *Limit* and *Charge* for State-Collected GeoData?
Whether Governments Have the **Right to Limit** and **Charge** for State-Collected GeoData?

Paradoxes

- Right
- Security
- Privacy
- Data
- Usability
- Economy

Chuang and Huang, 2005
### 3. Paradoxes

<table>
<thead>
<tr>
<th>Pro</th>
<th>Con</th>
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</thead>
<tbody>
<tr>
<td>luxury seldom for governments in developing nations / shifts in demographic structure in developed nations (fewer taxpayers...)</td>
<td>funding through taxation / data collected generally through state-funded projects</td>
</tr>
<tr>
<td>marginal cost charging/cost recovery/user pays</td>
<td>opposite effect for cost recovery / business model - revenue from ads</td>
</tr>
<tr>
<td>commercial value of map data / knowledge economy</td>
<td>Do government sale data bringing significant revenue? actually, NO!</td>
</tr>
<tr>
<td>unfair competition / fears of intellectual property leakage</td>
<td>charging diminishes in education/research activities</td>
</tr>
</tbody>
</table>
### 3. Paradoxes

<table>
<thead>
<tr>
<th>Pro</th>
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</tr>
</thead>
<tbody>
<tr>
<td>- No casual link between tax income and social demand for geospatial information</td>
<td>- The right of tax-payer/&quot;information commons&quot;/ altruistic/ USA model - Freedom of Information (Foi)</td>
</tr>
<tr>
<td>- Why not charging electricity free to all citizens?</td>
<td>- Charging against who can not pay / social exclusion</td>
</tr>
<tr>
<td>- Faceless consumer’s communicating ≠ mutual relationship</td>
<td>- Empowerment of citizens</td>
</tr>
<tr>
<td>- Difficulty and costly for extended user community both to listen to them and respond to their needs</td>
<td>- Difficulty for a public body to behave both commercially and also to fulfill the obligations of a public agency</td>
</tr>
</tbody>
</table>

Chuang and Huang, 2005
3. Paradoxes

**Pro**

- inefficiencies in data production and over supply
- USA Federal Map not meet market demands/ outdated
- US National Geography Society report- high levels of geo- illiteracy among US citizens
- UK Ordnance Survey data/ commercial rate/hours updated

**Con**

- open/free use = more use = more value
- geoDRM (geodata digital right management)
- research and teaching require large experiment with data -the US model -freely accessible to education process
- geoDRM (geodata digital right management)
3. Paradoxes

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>- national security/ especially after September 11, 2001/ anti-terrorism precaution</td>
<td>- availability of remote sensing/ satellite imagery render restricted geo-policy less effective</td>
</tr>
<tr>
<td>- privacy</td>
<td>- returned for more personally focus services</td>
</tr>
</tbody>
</table>