



Community GIS over the Web: A Categorization and Analysis

**The PNC 2004 Annual Conference and Joint Meetings
October 17-22 2004
Taipei, Taiwan**

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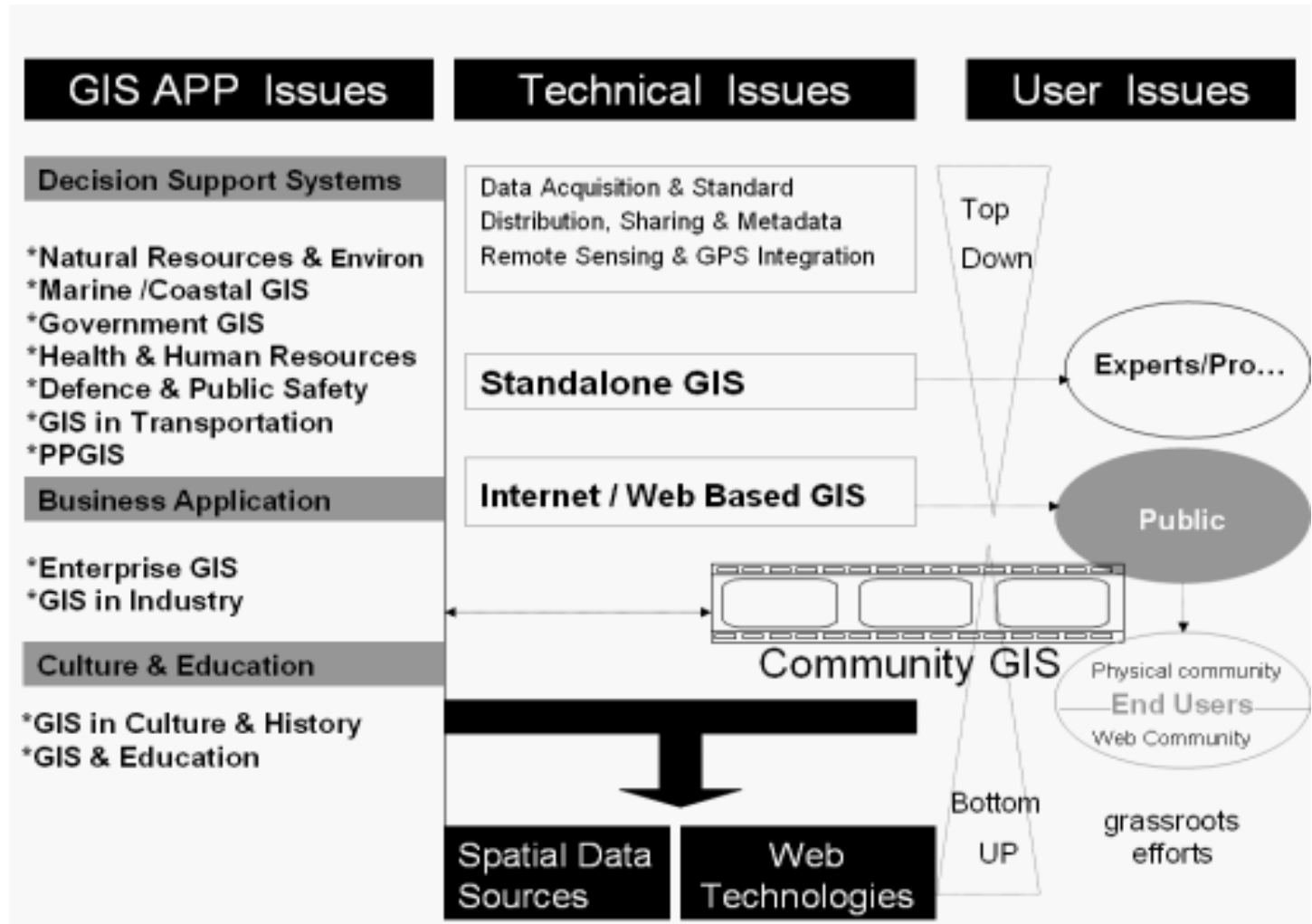
Our goal: To better understand the dimensions in Web-based community GIS.

Four dimensions

- o Spatial data sources
- o Web technologies
- o People and community
- o Sustainability



Application, technical, and user issues in GIS:





1.Spatial Data Sources

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- Authority-provided (e.g., satellite images, topographical maps).
 - Community-generated (e.g., user annotations, landscape photos, GPS traces).
 - Publicly accessible, geo-coded data (e.g., census data, zip code boundary).
 - From open access to user feedback and interaction, and then to collaborative analysis in real time and from different locations.
 - Data interoperability issues (cf. OGC, ISO/TC 211).

Types of Spatial Data Most Useful to Community Organisations

<i>Neighborhood Issue</i>	<i>Spatial Data</i>
Housing	Ownership Zoning Land use Assessed land/structure value Tax exemption status of land/structure Structural information on buildings Year of change of assessment code Property transfer information Tax delinquency status Building code violations Raze status Vacant lots Boarded-up homes
Economic Development	Employment opportunities List of neighborhood businesses Membership in business associations Small business lending data Job training programs Youth leadership
Crime	Incidents listed by dates, locations, types Parole data
Health/Environment	Health statistics Hazardous material storage sites Lead contamination data
Property Investment	Private mortgage data Public lending data
School Data	Public school data
Client Data	Contact data about members, participants Date of participation Participation activities

1. Spatial Data Sources

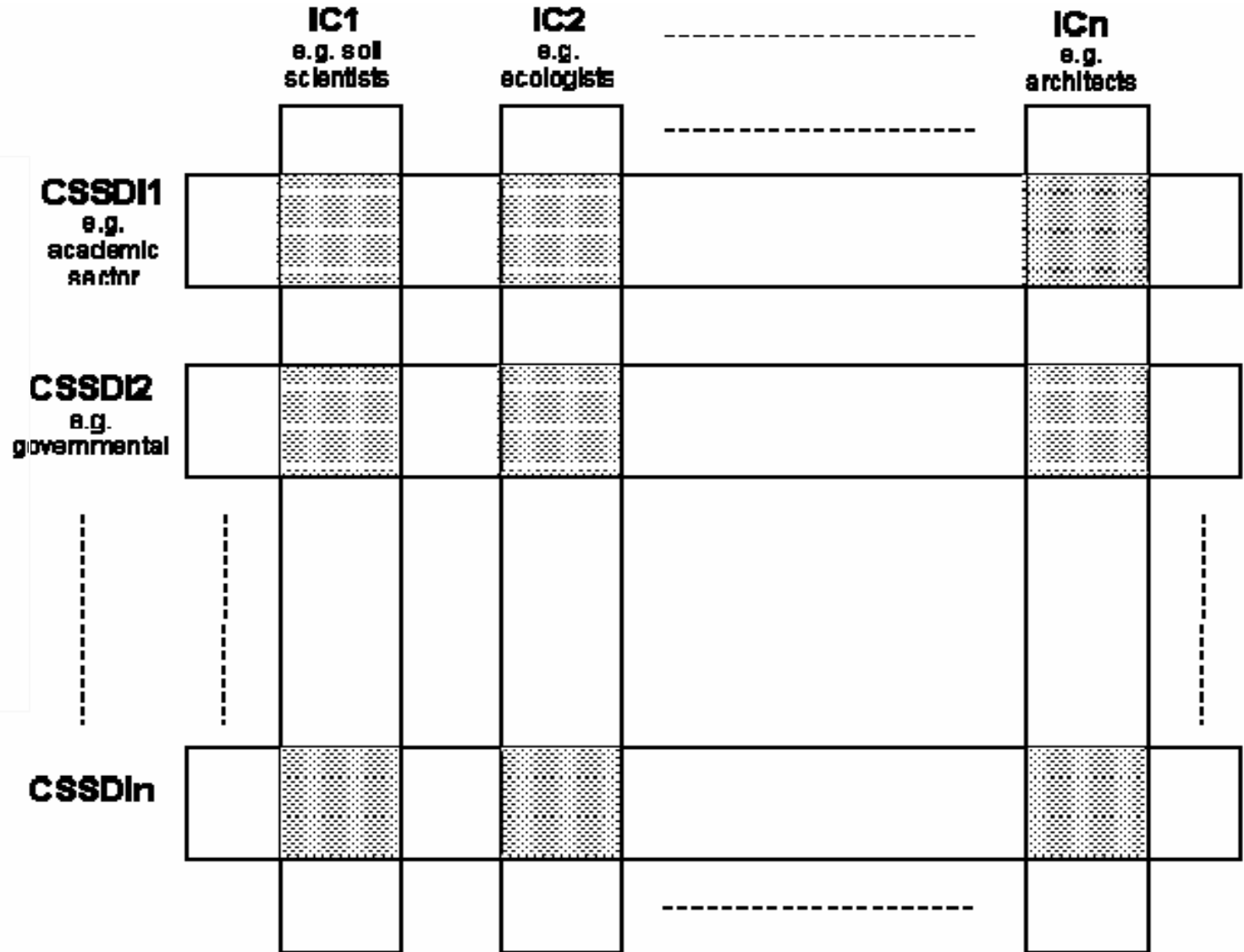
How would community-generated spatial data help the decision making process?

Sample of community-generated spatial data: Real-time crime report.



1. Spatial Data Sources

Relationship between Information Communities (ICs) and Sector or Community Specific Spatial Data Infrastructures (CSSDIs).





2. Web Technologies

Web and Community GIS

- Web and access (i.e., web server/browse).
- Web for interoperable geo-data (e.g., GML, SVG).
- Web as community development tool (e.g., mailing list archive, personal/community publishing).
- “Community GIS over the Web” needs all of the above.



3. People and Community

Community and Spatial Data

o Two types of community:

Concentrated (“local community”) – Community is residence-based and concerned about local issues.

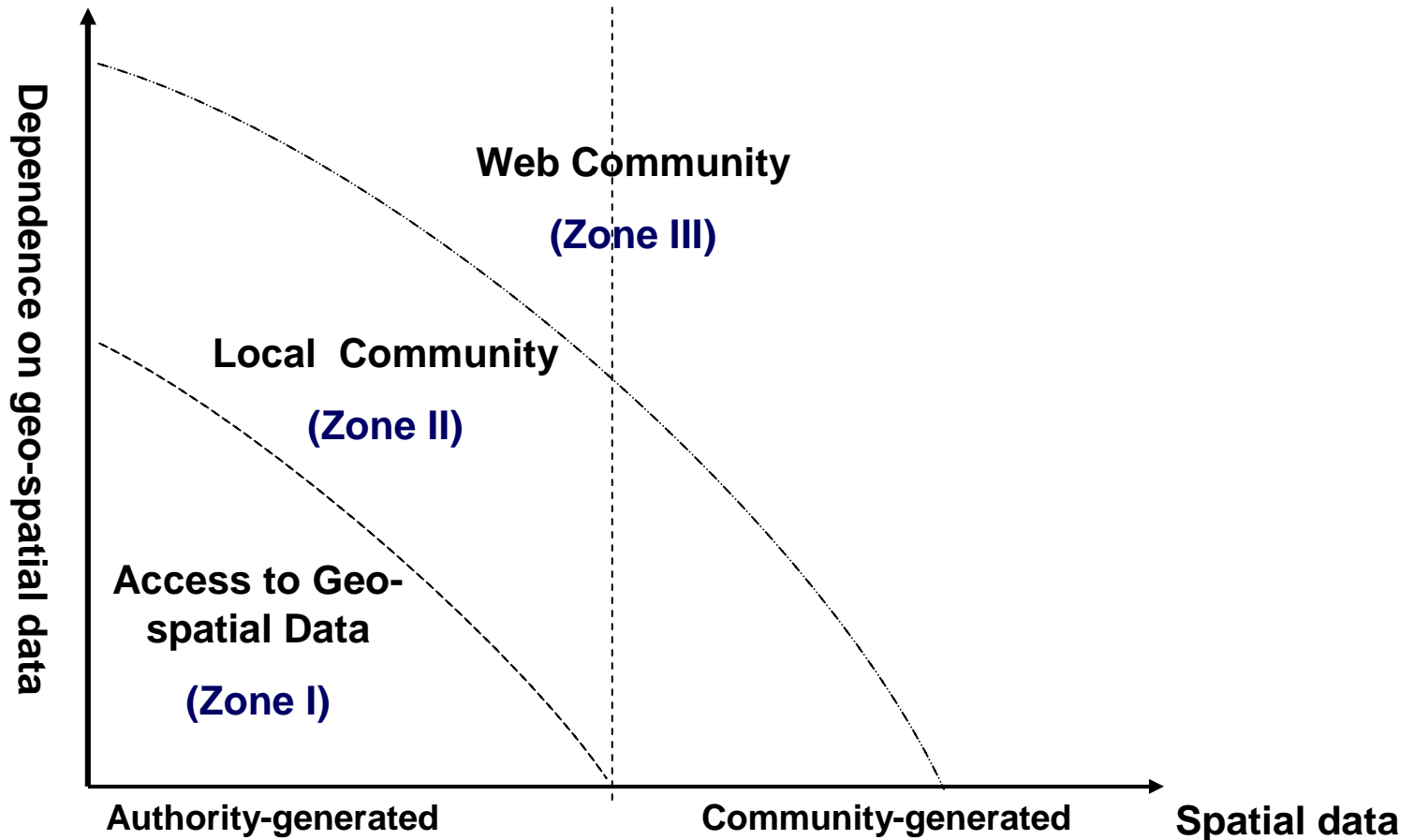
Dispersed (“web community”) – People are distributed globally but collaborating in specific issues.

o Degree of dependence of the community on geo-spatial data?



3. People and Community

- The which extent does the community **rely on** geo-spatial information to communicate and self-develop?



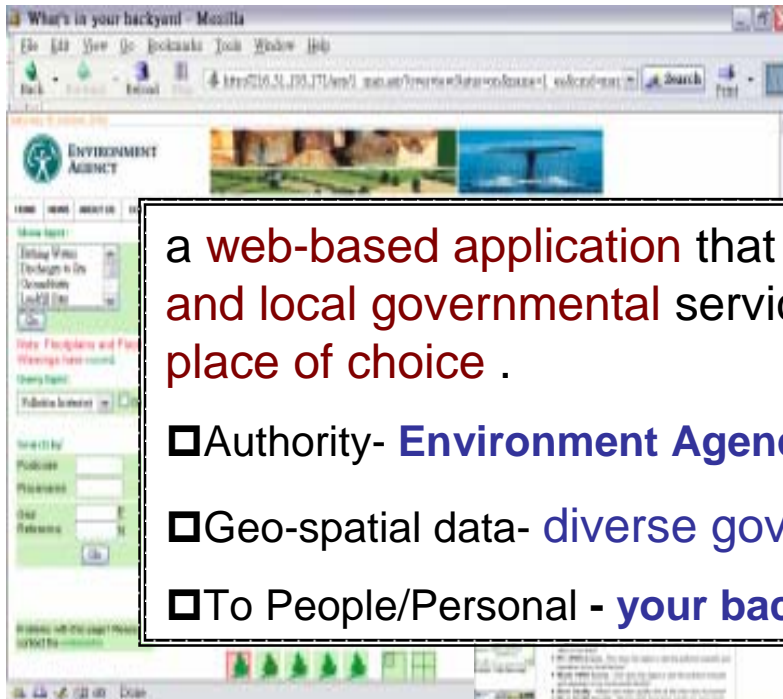
A proposed community GIS categorization.⁹



3. People and Community

Zone I – Access to Geo-spatial Data: Show Cases

□UK- What's in your backyard?



□US: Window to My Environment (WME)



a web-based application that allows the public to view detailed state and local governmental services /information in their neighborhood or place of choice .

- Authority- **Environment Agency/ Environmental Protection Agency**
- Geo-spatial data- **diverse government sources**
- To People/Personal - **your backyard/my window**





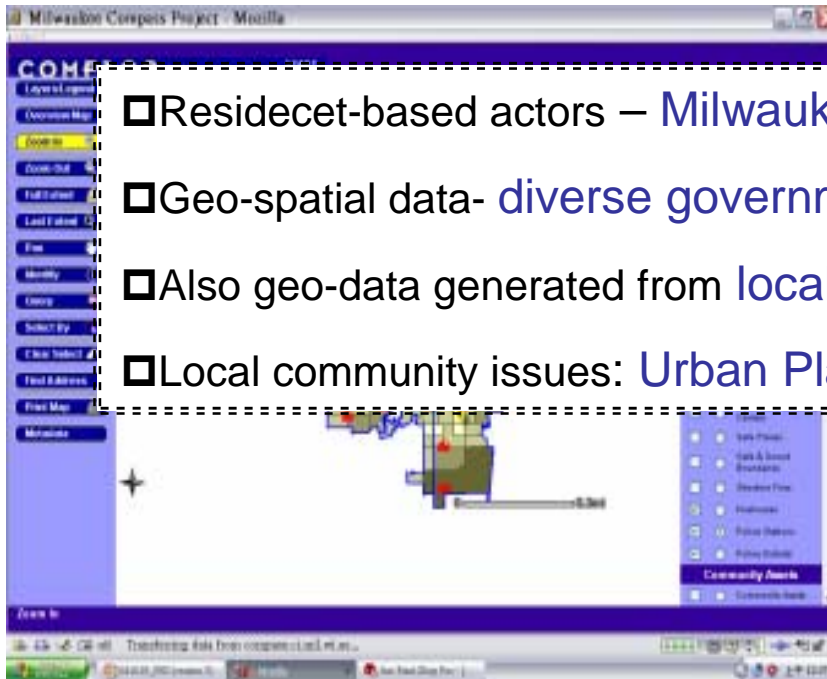
3. People and Community

Zone II – Local Community: Show Cases

▣ The City of Milwaukee: **Community Mapping, Planning, and Analysis for Safety Strategy (COMPASS)**

Over 17 grassroots community organisations of inner-city neighborhoods have been using spatial data and GIS in their participatory planning practices...

▣ Living Independently in Los Angeles (LILA)



- ▣ Residencet-based actors – Milwaukee & Los Angeles
- ▣ Geo-spatial data- diverse government sources
- ▣ Also geo-data generated from local community's participation.
- ▣ Local community issues: Urban Planning & Health



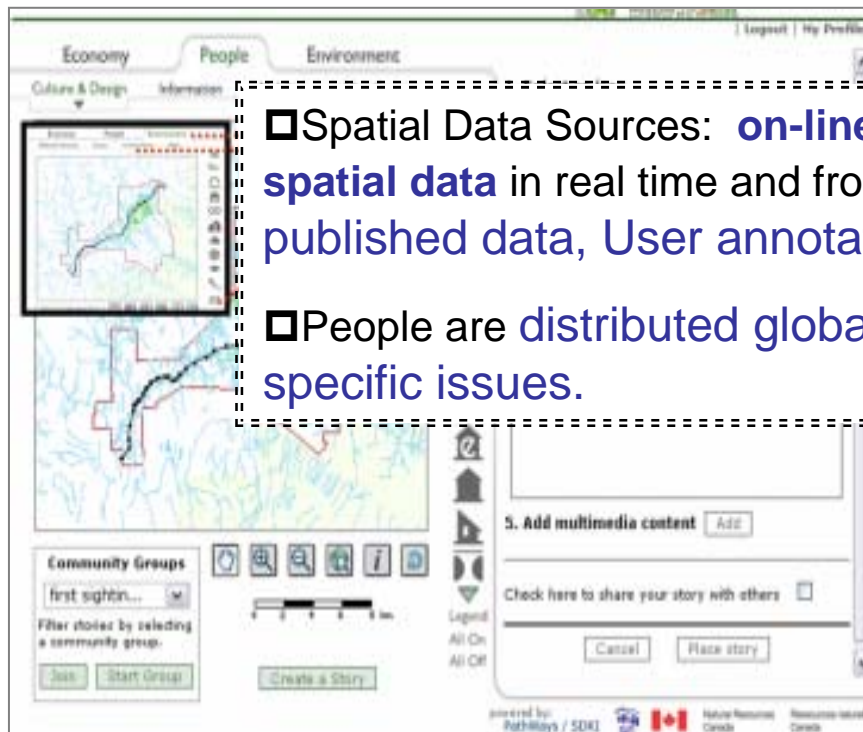


3. People and Community

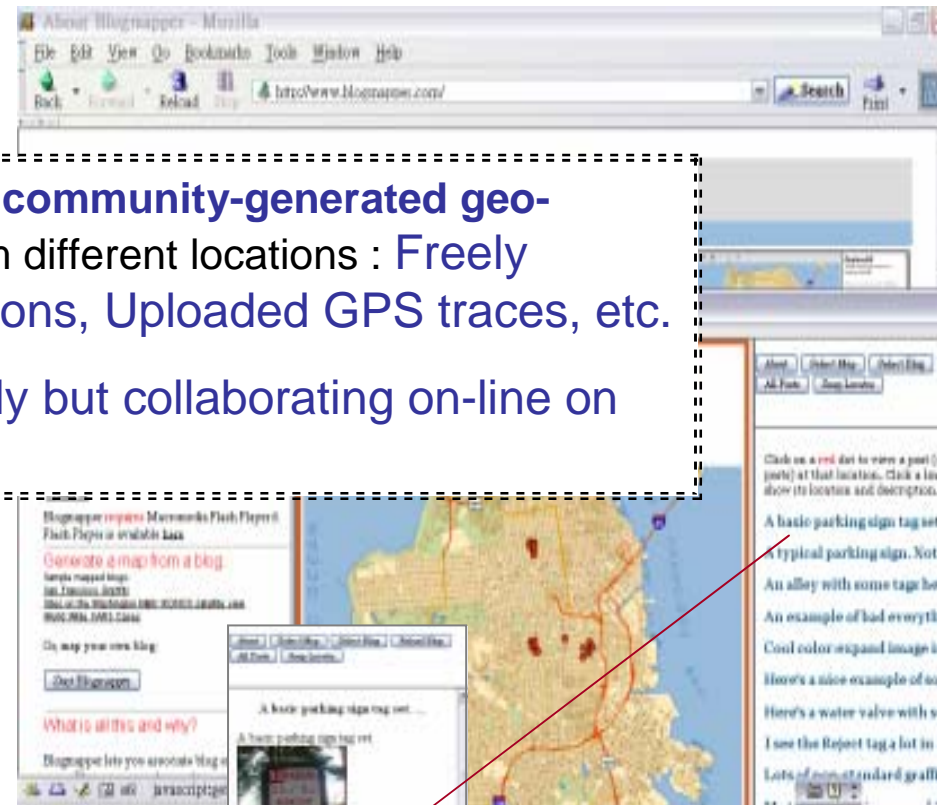
Zone III – Web Community: Show Cases

□ Canada: [CHiRP - Environmental Community Mapping](#)

□ [Blogmapper](#)



- Spatial Data Sources: **on-line community-generated geo-spatial data** in real time and from different locations : Freely published data, User annotations, Uploaded GPS traces, etc.
- People are **distributed globally** but collaborating on-line on **specific issues**.





3. People and Community

Zone III – Web Community: Show Cases

CONSUME.NET NODEDB

□ UK local groups + hook in annotations (RDF) + real time GPS+ GML

The screenshot shows the 'consume.net nodedb' web application. The browser window title is 'nodedb - Mozilla' and the address bar shows 'http://www.consume.net/nodedb.php'. The page features a central map of the UK with numerous nodes represented by circles of different colors (blue, green, red, yellow) and labels. A light blue grid is overlaid on the map. On the left side, there is a sidebar with navigation links such as 'Home', 'FAQ', 'Index', 'About', 'Contact', 'Help', 'Links', 'Privacy Policy', 'Terms of Use', 'Disclaimer', 'Sitemap', 'RSS', 'Atom', 'GML', 'RDF', 'XML', 'JSON', 'JSON-LD', 'JSON-Patch', 'JSON-Merge-Patch', 'JSON-LD-Framework', 'JSON-LD-Path', 'JSON-LD-Path-Extension', 'JSON-LD-Path-Extension-2', 'JSON-LD-Path-Extension-3', 'JSON-LD-Path-Extension-4', 'JSON-LD-Path-Extension-5', 'JSON-LD-Path-Extension-6', 'JSON-LD-Path-Extension-7', 'JSON-LD-Path-Extension-8', 'JSON-LD-Path-Extension-9', 'JSON-LD-Path-Extension-10'. On the right side, there is a control panel with the following options: 'Click to: Recenter', 'Get node info', 'Scale (in meters per pixel): 20', 'Size (in pixels): 480', 'Don't draw: Range circles for Card <-> Card covers (250M)', 'Node Labels', 'Operational nodes', 'In Testing nodes', 'Operational nodes', 'Disabled nodes'. The bottom of the browser window shows the 'Dose' taskbar.



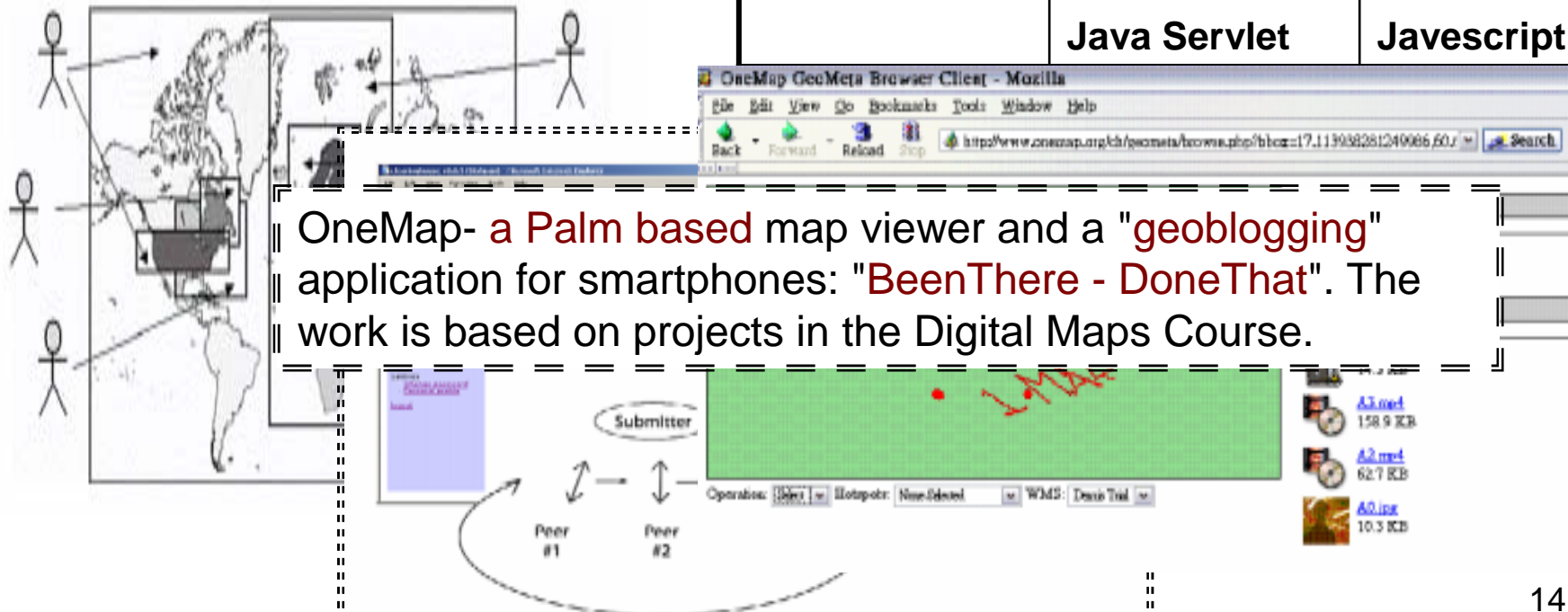
3. People and Community

Zone III – Web Community: Show Cases

OneMap : <http://www.onemap.org/>

- Starts from 2002/ Østfold University College, Halden, Norway / based on Open Source and Open Count principles.
- **Peer Review:**

Clearing House	Repository	Gate Way
Based on "peer review" principle	Distributed storage infrastructure	Browser based user interface
	GML/ WFS Java Servlet	SVG Javascript





4.Sustainability

- How to ensure the longevity of the community and the information system?
 - How to couple with rapid changes in social needs and information technologies?
-

Misund & Hoiberg (2003)
identify 10 characteristics of
“Sustainable Information
Technology for Global
Sustainability”

criteria

•OneMap Sustainability

- 1 Longevity
- 2 Demand
- 3 Simplicity
- 4 Quality
- 5 Accessibility
- 6 Responsiveness
- 7 Adaptivity
- 8 Scalability
- 9 Robustness
- 10 Stability



4.Sustainability

Using **SWOT model** (Strength, Weakness, Opportunity, Threatness) **to analyze the sustainability of web-based Community GIS.**



4.Sustainability

Strength :

- **Connecting, Community, Communication**
- **Efficiency, Effectiveness, Equity** (Tulloch and Epstein, 2002)

Weakness:

- **Distrust of users:** Why is GIS more useful in solving community problem? Does GIS play a central or a complementary role?
- **Consistency of human/technical/financial resources:** Issues of Institutional support and barrier.



Opportunity

- 80% of information has geo-spatial characteristics (?).
- Open access to authority geo-spatial data.
- Standards-based Web technologies and FLOSS (Free/Libre Open Source Software) development.
- A good way to bridge the digital divide (Ghose R 2003).



Threatness

- **Copyright issues:** For both authority-provided and community-generated data. (Creative Commons License may be a solution.)
- **Privacy issues:** For both individuals and communities.
- **Organizational Issues:** UN Statistic Division in April 2004 says that we are in the “Geographic Information Revolution,” and indicates that the major barriers and impediments to achieve the potentials will not be technical but rather organisational. (The biggest challenge will be for all players to cooperate with one another.)



Thank you for your patience!



2. Web Technologies

Web GIS – A Sound Tool for Neighborhood to Access Information.

User-defined data

- Freely published data
- User annotations
- Data gardening
- Upload of GPS traces
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Physical/base Data

Ubiquitous Computing

From Desktop to Mobile Devices

Location Based Service (LBS)

Commercial Software:

ArcInfo/ArcView, MapInfo, GeoMedia

Open Source: GML + SVG + RDF.....



3. People and Community

- **Zone I – Access to Geo-spatial Data:** Geo-spatial data mainly flows from the authority to the people; community development need not depend on GIS. .
- **Zone II – Local Community:** Resident based actors focus on local or centered community issues. This community mainly rely on government's geospatial infrastructure with more and more spatial data generated from physical/local community's participation. For example, many literatures have evidenced the PPGIS's achievement facilitating public decision process.
- **Zone III – Web Community:** Distributed geographically characters but collaborative in specific issues on-line, (feedback/interaction) in real time/ from remote locations. Based on the base geo data with the increasing on-line community-generated data in real time and from remote locations. eg: the applications of geo-blogging.