GeoDF: an innovative approach to online participatory planning

Forum VRM
May 13, 2009
Outline

- Nature of this approach
- How GeoDF prototype helps to bridge the communication gaps in online participatory planning
- Challenges
Nature of this approach

- Principles of Participatory Planning Approach
- Characteristics of Meaningful Participation
- Key Communication Requirements for Meaningful Participation
Need for participatory planning

Physical

Community

Human

Diverse values
Interests

Proponents
Decision-makers
Recipients

Community Planning Process

Outcome

Reconcile diverse interests into public interest

Community
Rittel’s principles of participatory planning approach

- Involves experts and non-experts (stakeholders) at an early stage of the process
- Problems and solutions evolve gradually as a result of ongoing discussion among stakeholders
- Demands a platform to exchange views and ultimately accomplish mutual understanding and consensus building
- Needs a transparent deliberation process so that participants can understand each other’s positions and make compromises through collaborative efforts
- Have access to the tools and information to enable constructive deliberations and informed decisions
Public participation ladder

Minimum requirements for meaningful participation

[Modified after Wiedemann and Femers, 1993; Carver et. al, 1998]
## Key communication requirements for meaningful participation

<table>
<thead>
<tr>
<th>Rung</th>
<th>Participation Outcome</th>
<th>Flow of info &amp; share of power in DM</th>
<th>Type of interaction</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>PP in final decision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>PP in assessing risks &amp; recommending solutions</td>
<td></td>
<td>Many-to-many</td>
<td>Participative Model</td>
</tr>
<tr>
<td>4</td>
<td>PP in defining interests, actors, and determining agenda</td>
<td></td>
<td>Minimum requirements for meaningful participation</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Public right to object</td>
<td></td>
<td>One-to-many</td>
<td>Broadcast Model</td>
</tr>
<tr>
<td>2</td>
<td>Informing the public</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Public right to know</td>
<td></td>
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</tr>
</tbody>
</table>

Minimum requirements for meaningful participation
Characteristics of planning discussions

- **Intensive** communication
- Ideas & solutions **evolve** as discussion progresses
- Discussions are generally **spatially-related**

**Face-to-face Discussion**

**Spatial context** conveys via
- Dialog
- Maps
- Sketches
- Annotations
Research question

Can GIS enhance communication during spatially-related discussions in online participatory planning?

- Identify communication needs for spatially-related discussions in PP
- Develop evaluation criteria
- Assess existing applications
- Assess proposed prototype
- Compare results
Developing evaluation criteria

Step 1

Rittel’s principles of participatory planning approach

translate into

Step 2

Goals of participatory planning

convert into

Tasks for achieving the goals

derive

Step 3

Technical solutions for satisfying the communication needs arising from the tasks

synthesize and group into

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
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</thead>
<tbody>
<tr>
<td>Enable experts to play the facilitators’ roles</td>
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</tbody>
</table>
Criteria for effective communication

- Enable experts to play the facilitators’ roles
- Enable free & fuller expression of views
- Support exchange of views among participants
- Document & share evolution of issues/ideas
- Show decisions in context to related decisions
- Support effective communication of spatial context
Reviewing current PPGIS applications – Tools that aid communication

Map Hackney, U.K.
http://www.map.hackney.gov.uk/HackneyMap.asp

Email + annotations + map attachment
✓ Spatial context communication
✗ Opinions exchange

Orange County Interactive Mapping, Florida
http://www.cityoforlando.net/public_works/esd/gis/interactive_mapping.htm
Reviewing current PPGIS applications (2)


The following comments were made:

We think that the traffic problem in cars road is lorries and other hgv's could be re-routed away from the village center by an alternative road which crosses the river further down towards huddersfield directly on to manchester road. When the canal project is being constructed we envisage terrible congestion due to the heavy traffic which has to travel along cars road to the industrial estate. Our second point is the appearance of the shop fronts in cars road. Their aesthetic appearance is not conducive to how we perceive the village once the canal project has been completed. The whole of the shop fronts that line cars road and line the route of the canal really ought to be refurbished in some consistent style which fits in the canal ambience. Once this has been done perhaps the canal and the shops could be brought together with bubbles.

Geo-referenced comments

✔ Opinions exchange (unstructured)
✘ Spatial context communication
Reviewing current PPGIS applications (3)

Argumentation Map, Germany
Keßler et al., 2005

Online Discussion Forum + Geo-referenced comments
✓ Views exchange (structured)
✗ Spatial context communication
### Evaluating existing applications – summary

<table>
<thead>
<tr>
<th>Tools</th>
<th>Enable experts to play the facilitators’ roles</th>
<th>Free &amp; fuller expression of views</th>
<th>Exchanging of views</th>
<th>Document &amp; share evolution of ideas</th>
<th>Show decisions in context to related decisions</th>
<th>Effective communication of spatial context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email / feedback form</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Email + annotation tools + map attachment</td>
<td>×</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>Geo-referenced comments</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Online Discussion Forum + Geo-referenced comments</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Communication gaps in current applications

- Communication needs for PP not adequately addressed
- Show decisions in context to related decisions
- Spatial context – essence of spatially-related discussion cannot be conveyed effectively
How GIS-enabled Online Discussion Forum (GeoDF) bridges the communication gap in online participatory planning

- Focuses on conveying spatial context
- Design considerations
- Key functions of GeoDF
How to facilitate spatially-related discussion

Let’s lease that part of the vacant land that is near the bus stop to a store...

Geographical location

Spatial objects

Geographical extent

Spatial relationships

Understand better

Express clearly

SPATIAL CONTEXT

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Planning discussion scenario

Pot hole!!

Local residents

J. Smith

M. Taylor
I think on-street parking along Beaverbrook Street near UNB main gate is causing traffic jam. I suggest no parking should be permitted there during rush hours.

I think a pot hole near the grocery store is slowing down the traffic!
I think on-street parking along Beaverbrook Street near UNB main gate is causing traffic jam. I suggest no parking should be permitted during rush hours.
GeoDF prototype (cont’d)

A big hole on the road slows down traffic

Street parking causes traffic jam on Beaverbrook St

Reply message

I agree. I see another problem. There's a big pot hole near the grocery store which is slowing down the traffic.
Conveying spatial context in discussions

Face-to-face Discussion

Let’s lease …

Spatial context conveys via
- Dialog
- Maps
- Sketches
- Annotations

Online Discussion

Web GIS

GIS-Enabled Online Discussion Forum

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### Key design considerations

#### User Characteristics

<table>
<thead>
<tr>
<th>Users</th>
<th>General public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer/ GIS skills level</td>
<td>Varies; majority is novice users</td>
</tr>
<tr>
<td>No. of expected users</td>
<td>Hundreds to thousands</td>
</tr>
<tr>
<td>Are plug-ins acceptable?</td>
<td>No</td>
</tr>
</tbody>
</table>

- Simple GIS functionality
- Internet
- HTML Map Viewer
## Key design considerations (2)

### Functional Requirements

<table>
<thead>
<tr>
<th>Synchronous/asynchronous application?</th>
<th>Asynchronous – different time/different place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main functions</td>
<td>Support expression of ideas &amp; mutual understanding</td>
</tr>
<tr>
<td></td>
<td>- Evolution of ideas</td>
</tr>
<tr>
<td></td>
<td>- Exchange of ideas</td>
</tr>
<tr>
<td></td>
<td>- Effective communication of spatial context</td>
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</tbody>
</table>

### Online discussion forum

- Sketching & Annotations
- Basic map viewing/browsing/query
- Simple spatial analyses

### Web-GIS:

- Sketching & Annotations
- Basic map viewing/browsing/query
- Simple spatial analyses
System architecture
Formalization and implementation of the concept of spatial context
GeoDF: user interface
How are discussion contributions structured

- Organized by issues (Issue-Based Information System by)

  - Topic
  - Issues
  - Positions
  - Arguments

Switch between topics from here
Capturing extent of issues

Participant #1

Contributor: Kevin

Message:
I'm a student. I don't have a car and I take the bus often. I really don't go to Fred Mill very often because the bus routes at Friday Mall are much more frequent.

Participant #2

Contributor: Kevin

Message:
The running a pizza restaurant next to the bus stop at Fred Mill. Most of my clients come with their cars. The bus stops by the stores less often than the buses which I'm very glad about that.

Participant #3

Contributor: Kevin

Message:
I'm a student. I don't have a car and I take the bus often. I really don't go to Fred Mill very often because the bus routes at Friday Mall are much more frequent.
Sketching and annotations
Measuring distances
Tell the community about an issue

[Maps and pop-up windows showing area information and community notification]
Using multi-media to explain plans

- Explains how plans are derived (video clips, PDF, etc.)

- Shows temporal change of development
Explore current status of discussion

- Displays areas of hottest discussions
Evaluating GeoDF (1)

<table>
<thead>
<tr>
<th>Positions</th>
<th>Replies</th>
<th>Last Post</th>
<th>Select</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sticky: The concept plan</strong></td>
<td>0</td>
<td>21 Oct 2000 12:01 am</td>
<td></td>
</tr>
<tr>
<td><strong>Why not consider multi-storey car parking?</strong></td>
<td>3</td>
<td>30 Mar 2006 05:56 am</td>
<td></td>
</tr>
</tbody>
</table>

Enable experts to play the facilitators’ roles

GeoDF ✓
Evaluating GeoDF (2)

Multiple media (e.g., maps, sketches, text, etc.)

Users can initiate discussion

<table>
<thead>
<tr>
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<th>Free &amp; fuller expression of views</th>
<th>Effective communication of spatial context</th>
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<tbody>
<tr>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>
Evaluating GeoDF (3)

Exchange views among participants

Exchange of views

GeoDF ✓
Evaluating GeoDF (4)

contributions organized by topics, issues, time

Document & share evolution of ideas
GeoDF
Evaluating GeoDF (5)

Structured contributions facilitate easy tracing of intermediate decisions

Potentially related arguments

Moderator can reorganize contributions

Show decisions in context to related decisions

GeoDF

✔
## Comparing evaluation results

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<tbody>
<tr>
<td>Email / feedback form</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
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<td>✗</td>
<td>✩</td>
<td>✗</td>
<td>✗</td>
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<td>✩</td>
<td>✗</td>
<td>✗</td>
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<td>✩</td>
<td>✩</td>
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<td>✩</td>
<td>✩</td>
<td>✩</td>
<td>✩</td>
</tr>
</tbody>
</table>

- ✗: Not supported
- ✩: Supported
- ✧: Highly supported
Challenges

- Improves the decision-making process but not automatically leads to better decisions
- Provides alternative means of participation but can’t guarantee willingness of participation
- Openness of government
- Differential access to data and technology
Challenges (cont’d)

- Usability
- Map data not available in the public domain
- Registration – curtails participation? Privacy issues?
- How to weight contributions being collected?
- Who should host GeoDF? Government? NGOs? Interest groups? General public?
Acknowledgement

- Dr. David Coleman
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- Michael Baldwin, UNB, Campus Services & Planning
- Richard Chan
Thank YOU!

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