Individual Decision Making in Online Public-Participation Transportation Planning

Martin Swobodzinski
Portland State University, swobod@pdx.edu

Follow this and additional works at: https://pdxscholar.library.pdx.edu/trec_seminar

Recommended Citation
https://pdxscholar.library.pdx.edu/trec_seminar/109

This Book is brought to you for free and open access. It has been accepted for inclusion in PSU Transportation Seminars by an authorized administrator of PDXScholar. Please contact us if we can make this document more accessible: pdxscholar@pdx.edu.
Individual decision making in online public-participation transportation planning
Acknowledgements

Participatory GIS for Transportation Project (www.pgist.org). Research supported by National Science Foundation Grant No. EIA 0325916, funded through the Information Technology Research Program, and managed in the Digital Government Program.
Acknowledgements

**Principals**
Tim Nyerges, UW
Piotr Jankowski, SDSU
Rhonda Young, UWY
Terry Brooks, UW
Scott Rutherford, UW

**Consultants**
Robert Aguirre
Fixie Consultants
Puget Works

**Partners**
Puget Sound Regional Council
King County
City of Seattle

**Research Assistants**
Matthew Wilson
Kevin Ramsey
Mike Lowry
Arika Ligmann-Zielinska
Martin Swobodzinski
Adam Hindman
Michael Patrick
John Le
Zhong Wang
Jie Wu
Guirong Zhou
Tao Zhong
Participation

8  Citizen Control
7  Delegated Power
6  Partnership
5  Placation
4  Consultation
3  Informing
2  Therapy
1  Manipulation

(citizen power)

(tokenism)

(nonparticipation)

(based on Arnstein, 1969)
Use of Technology

Process  Technology  Outcomes

Satisfaction

Performance
Illustration
Task-Technology Fit

GIS Technology
Geographical Tasks
Spatial Abilities
Intrinsic Incentive

Performance
Goal Commitment
Goal Level

System Utilization

(based on Jarupathirun and Zahedi, 2007)
During the next 25 years the central Puget Sound population is expected to grow by 1.2 million people.

How will this growth impact our already congested transportation system?

What improvements are necessary to keep our region moving?

Who gets to have a voice in this decision?
Puget Sound

Map of Puget Sound with major cities, city limits, motorways, and main roads. The map includes areas such as Everett, Snohomish, Edmonds, Seattle-Bellevue, Renton, Kent, Tacoma, Lakewood, Puyallup, and Kitsap.
LIT Steps

1. Concerns

2. Factors

3. Individual Package

4. Group Package

5. Report

Center for Spatial Analysis and Research (CSAR)
Challenge

Groups of users with similar user interaction?

Socio-demographics
Cognitive Style Indicator*
Travel behavior
Computer/Internet proficiency

*(Cools and van den Broeck, 2007)
<table>
<thead>
<tr>
<th>timestamp</th>
<th>user_id</th>
<th>treedd</th>
<th>url</th>
<th>sessionid</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/14/2007 5:54:37 PM</td>
<td>1034248</td>
<td>10</td>
<td>login.do</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:54:37 PM</td>
<td>1034248</td>
<td>10</td>
<td>main.jsp</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:54:40 PM</td>
<td>1034248</td>
<td>10</td>
<td>WorkflowAgent.getWorkflows.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:54:40 PM</td>
<td>1034248</td>
<td>10</td>
<td>userhome.do</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:54:42 PM</td>
<td>1034248</td>
<td>10</td>
<td>SystemAgent.getAnnouncements.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:54:43 PM</td>
<td>1034248</td>
<td>10</td>
<td>WorkflowAgent.getWorkflow.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:55:04 PM</td>
<td>1034248</td>
<td>10</td>
<td>SystemAgent.getAnnouncements.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:55:05 PM</td>
<td>1034248</td>
<td>10</td>
<td>WorkflowAgent.getWorkflow.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:55:12 PM</td>
<td>1034248</td>
<td>10</td>
<td>RegisterAgent.getUserTrips.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:58:11 PM</td>
<td>1034248</td>
<td>10</td>
<td>RegisterAgent.saveUserTrip.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:58:23 PM</td>
<td>1034248</td>
<td>10</td>
<td>userhome.do</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:58:24 PM</td>
<td>1034248</td>
<td>10</td>
<td>SystemAgent.getAnnouncements.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:58:25 PM</td>
<td>1034248</td>
<td>10</td>
<td>WorkflowAgent.getWorkflow.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:58:32 PM</td>
<td>1034248</td>
<td>10</td>
<td>workflow.do288</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 5:58:33 PM</td>
<td>1034248</td>
<td>10</td>
<td>WorkflowAgent.getWorkflow.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 6:01:22 PM</td>
<td>1034248</td>
<td>10</td>
<td>CCTAgent.getContextConcerns.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
<tr>
<td>10/14/2007 6:01:22 PM</td>
<td>1034248</td>
<td>10</td>
<td>CCTAgent.prepareConcern.dwr</td>
<td>88A666C75B48FD1CDAEBA2460440174D</td>
</tr>
</tbody>
</table>
Capturing Activities

deliberation

analysis

information gathering

total duration
HCI Analysis Overview

Server Logs → Extraction → User Activities

Clustering → Groups of similar interaction → Regression

Analysis Iteration → Group Predictors

Center for Spatial Analysis and Research (CSAR)
Clustering Algorithms

- Multiple sequence alignment analysis*
- Hierarchical cluster analysis

*(Abbott, 1990; Shoval and Isaacson, 2007; Fabrikant et al., 2008)
Clustering Summary

• HCA: Usable classification for total time
• MSA: Reliability concerns
• Analytical synergies MSA ↔ HCA
Logistic Regression Summary

Groups with similar overall interaction duration

- Socio-demographics
- Cognitive Style Indicator*
- Travel behavior
- Online transportation discussions

*(Cools and van den Broeck, 2007)
What about Individual Choices?

Center for Spatial Analysis and Research (CSAR)
Location Analysis

Outside buffers: 40%
Walking distance: 30%
Bicycling distance: 22%
Driving distance: 8%

Center for Spatial Analysis and Research (CSAR)
Cost Analysis

Me

$159
$8,731

VS

You

Median
Sum

$378
$16,348
Location/Cost Analysis Summary

• Self-centrism prevailing
• Need for moderation
• Feed observed patterns into process
• Complexity! Performance?
Conclusions

• System, process, outcomes
• Capturing, evaluating HCI in web-based DSS (LIT as case study)
• Analysis of behavior; profiling of the ‘public’
• PPGIS, spatial equity; greater good?
Conclusions

Access

Representation

Attrition
Take-home Message

• Public :: individuals
• Participation = f(opportunities for participation)
• Towards an individual-centered approach
Thank you!

Martin Swobodzinski
swobod@pdx.edu