Pathfinder: Routing Interviewers Efficiently For Field Studies

Steve Coombs and Nick Schultz
Kerryann Diloreto and Drew Vogel
University of Wisconsin Survey Center

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Overview

• The most challenging CAPI wave in UWSC history
• Need for complex mapping tool
• Pathfinder description
• Demo
The 2010 CAPI wave of the Wisconsin Longitudinal Study

• The WLS challenge
  • WI high school graduates of the class of 1957
  • UWSC conducted last two waves of WLS via CATI
  • N=12,500
  • In-home interview lasting 3 hrs
  • 9 anthropometric measures
  • DNA sample collection (saliva)
  • 60 Interviewers and 7 Team Leaders
• Located in WI and throughout the United States
  • How to keep travel costs down?
  • How can we route Interviewers efficiently?
UWSC’s history with CAPI studies

- Many projects throughout the years
- Small in size compared to the WLS
- Mostly Midwest states (WI, IL, IA)
  - Midwest Young Adult study (MYA)
    - N=600
  - Milwaukee Area Renters Study (MARS)
    - N= 2,000
- With WLS, would have to think on a larger scale
- Sample points in all 50 states
- 66% sample in WI, 75% in Midwest; remaining sample scattered throughout the US
Identifying the need

• How do we route Interviewers precisely and efficiently?
• Need for a robust mapping tool
• WLS Sample:
  • High-density areas
    • Scheduling 2 appointments a day
  • Low-density areas
    • How to efficiently route Interviewers to keep costs down
• How can we incorporate cost-checking of travel into our quality control process?
• Visual representation of caseload of Interviewers for trip planning purposes
Options we researched

• Microsoft Streets and Trips
• Google Maps, Mapquest, other online mapping tools
• GPS devices like Garmin
• Physical maps and atlases
Microsoft Streets and Trips

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<tr>
<th>Pros</th>
<th>Cons</th>
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<tbody>
<tr>
<td>User friendly</td>
<td>Released yearly; goes out of date</td>
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<tr>
<td>Software installed and runs off of laptop</td>
<td>Construction developments and changes to routes may not be up to date</td>
</tr>
<tr>
<td>Does not need internet connection</td>
<td>Must data-enter all address info by hand</td>
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Googlemaps/Mapquest, other free online mapping sites

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<tr>
<td>User friendly</td>
<td>Requires internet connection</td>
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<tr>
<td>Little training necessary; most field interviewers have used in past</td>
<td>Must data-enter all address info by hand</td>
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GPS devices (Garmin)

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<tr>
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<tr>
<td>Proven track record of success by current CAPI crew; recommended by</td>
<td>Expensive</td>
</tr>
<tr>
<td>other survey centers</td>
<td></td>
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| Does not require opening laptop if lost (compared to Microsoft      | Must data-enter |}
| Streets and Trips)                                                   | all address info by hand |
# Paper maps and atlases

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<th>Pros</th>
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<tr>
<td>Does not require internet connection</td>
<td>Paper maps often not detailed enough; rural routes and</td>
</tr>
<tr>
<td></td>
<td>country roads</td>
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<tr>
<td>More user friendly (dependant on preference)</td>
<td>Less user friendly (dependant on preference)</td>
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Identifying a need

• None of these tools perfect
• Not in project budget to purchase GPS units
• Common deficiency:
  • All of these tools require Interviewers to enter address data
  • Millions of keystrokes over course of 2 year field period
  • Introduces data entry error
  • Inefficient
“Pathfinder” is born

- UW Applied Population Lab
  - Department in Rural Sociology at UW Madison
  - Unite applied demography with spatial information and analysis
- Create a tool that interviewers could use to route interviews
- Cure the common deficiency
  - Pre-load all existing WLS sample address information
  - Interviewers would not have to data enter
  - All sample was traced a month and a half before
Pathfinder: What is it?

- Mapping software that is integrated with our project management database (Access)
- “Mash up” of Googlemaps and Mapquest APIs (application programming interfaces)
  - APIs allow for other programs (like Pathfinder) to interact with that application
  - Pulls maps from Googlemaps
  - Calculates the most efficient route using Mapquest
Pathfinder: How does it work?

• Interviewer’s caseload is viewable on map
  • Supervisor can view all case assignments by Interviewer

• Visual as to where cases are and which ones could be included in a route
  • Flexibility of creating and saving multiple routes to find the most efficient path

• Example use:
  • Interviewer schedules a morning interview
  • Checks Pathfinder to see which cases in the area could be scheduled for an afternoon interview
  • Attempts to schedule afternoon interview for efficient routing
Pathfinder: How does it work?

- Routes selected by shortest overall time, not distance
- Interviewers submit mapped routes with timesheets
- Team Leaders can check the routes against the Interviewer’s expense reports
- Freshness of data
  - New address information found by Interviewer
  - Interviewer synchronizes with server
  - New info is updated in CASES within one hour
DEMO
Summary

- Interviewers have other mapping resources available to them, however…
  - Must turn in Pathfinder maps with their timesheets to be paid
  - Quality control for travel expenses is easy to conduct
- Pathfinder has also been extremely useful in other ways
  - Identifying ideal interviewer location for future hires
  - Monitoring Interviewer’s caseload
  - Reassigning cases from one Interviewer to another
Thank You!

For copies of this presentation or more information, contact:

Steve Coombs scoombs@ssc.wisc.edu
Nick Schultz nschultz@ssc.wisc.edu

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