Implementation of a Tablet Map as Input Device for Respondents in a Collaborative Approach to CAPI Interviewing

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Chicago Communities Study

- CAPI pilot study
- Dynamic Tablet Screen Maps (DTSM)
 - Runs on a tablet device
 - Electronic mapping tool to replace paper maps
 - Respondents submit answers to geospatial survey questions
 - Load answers into CAPI survey instrument



Collaborative Approach





- Connects CAPI instrument and tablet device
 - Interviewer uses the laptop
 - Respondent uses the tablet



Collaborative Approach - Data







- Bi-directional data flow
 - Available and editable on both devices
- Unifies input from each device into a single data store
 - CAPI instrument data structure



Laptop Services



- CAPI instrument
- Wi-Fi hotspot
 - Virtual Router Manager
 - Encrypted, password protected
 - No internet connection
- IIS Web Server
 - Hosts custom web application (DTSM)
- MySQL database
- Map server and tiles
 - Tilestache



Tablet Features

- Wi-Fi connection to laptop
- DTSM website hosted on laptop
 - Safari web browser
 - Displays maps as web pages
 - Accepts respondent input
 - Stand-by mode
 - Showcards
 - Static and dynamic
 - Self-Administered survey
 - CASI



Now we have some other questions about different groups in American society. Here is a seven-point scale on which the characteristics of people in a group can be rated. In the first statement a score of 1 means that you think almost all of the people in that group are "poor." A score of 7 means that you think almost everyone in the group is "rich." A score of 4 means you think that the group is not towards one end or another, and of course you may choose any number in between that comes closest to where you think people in the group stand.

On this scale, in general, where would you rate Whites?

Poor						Rich
1	2	3	4	5	6	7
\bigcirc	\bigcirc	\odot	\odot	\odot	\bigcirc	\bigcirc



Technical Details

- DTSM software
- Process flow
- Interface between the tablet and the laptop



DTSM - Technical Details

- Web Application
- C#, HTML, Javascript
- Implements local map tiles
 - Tilestache
 - GeoJSON
- MySQL database
 - Contains configuration data
 - Flexible and responsive to changes



MySQL Database

- Survey questions and responses
- CASI questions and responses
- Study configuration
 - Future implementations in other geographic regions





Database

- Survey Questions
 - Define attributes
 - Handle all potential programmatic behaviors of the DTSM
 - Program the attributes, not questions
 - Modular design
 - Changes in order, adding, removing
 - Modify attributes during debugging





Survey Questions - DTSM Configuration









Survey Questions - DTSM Behavior





Survey Questions - DTSM Commands



Showcards

- Text files
 - HTML fragment
 - Inserted into static HTML frame in the DTSM
 - Ability to update with instrument changes
- Static
- Dynamic
 - HTML file with data fills from survey instrument



Dynamic Showcard







Database - Selection Calculations



Technical Details

• DTSM software

• Process flow

• Interface between the tablet and the laptop



Process Flow – Data Collision





Process Flow - Goals

- Strict controls
 - Maintain synchronization between Interviewer and Respondent
 - Only one device/person has control
- Consistent behavior throughout entire interview
 - Easy for Respondent to interact with
 - Intuitively clear to interviewer which device has precedence
- Interviewer maintains control over the data interview process



Process Flow





- Require tapping [Submit] button
 - Even if response is a single region
 - Allows Respondent to consider their answer before finalizing
 - Standard web-form processing (submit the form)
 - Prevents further changes while the Interviewer is processing or confirming answer
- Lock down the tablet until new command issued from the laptop



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Map Input Question

SURVEY CENTER



Map Input Question





<1>

<2>

<d>

<r>

Map Input Question



Summary

- Linked CAPI survey to a tablet device
 - Collaborative, bi-directional data flow
- Both Interviewer and Respondent input data
- Flexible system, defined through database
 - Adapt to changes in instrument
 - Allow for future study waves in new geographic regions
- Strict process flow control
 - Interviewer framework
 - Consistent experience for Respondents
 - Prevent data collision



Summary - Future Uses

- Maps and beyond...
 - Charts
 - Graphical response
- Electronic Showcards
 - Easier for interviewer
 - Automatically appear at the correct time
 - Dynamic data
 - Randomize option order
 - Enable respondent input
- CASI/ACASI
- Doorstep screening on tablet



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