Challenges and Advances in Using the iPad® Computer-Assisted Personal Interview System

March 20, 2013

Heather Driscoll, M.S.
Autumn Foushee, M.S.

2013 Fed CASIC Conference
Washington, D.C.

iCAPI: Challenges and Advances

- What we know about iCAPI
- iCAPI in Action
- Cost, Quality, and Lessons Learned
- Looking Ahead

What we know about iCAPI…

- It is **faster** than paper:
  - Don't have to wait for mailing
  - Don't have to wait to data entry
  - Don't have to wait for confirmation of errors, because…
- It offers **improved data quality**:
  - We can program skip and logic checks
  - Errors can be corrected at the point of interview, which is both faster and more accurate than relying on memory

What we know about iCAPI

- It offers other **tech features**, for example:
  - A GPS, which can help interviewers find sites and record locations
  - Access to helpful resources: site directories and maps, vessel directory, fish identification sites
- It offers **other advantages**, such as:
  - In-field QA
  - Real-time tracking of assignments and interview progress
  - Increased data security/reduced data loss

Anticipated Challenges

- **Increased interview times** /reduced response rates
- Interviewer **training** challenges
- Field **viability** of data collection device
  - Weather concerns (sun/rain/saltwater)
  - Battery life
  - Data transfer
  - Use of device in concert with other needed equipment
- Device **security** (iPads are popular!)

Fisheries Intercept Survey – Pilot Tests

Goal

Determine feasibility of iCAPI for large-scale fisheries intercept survey, including suitability for field conditions, impact on data quality, and cost.

Method

Multiple phases of in-field pilot test.

Mode

In-person interviews using iCAPI data collection with 1st generation iPad.

Study Design – Phase I & Phase II

Pilot Test Phase I: Observational Data

- Functionality
  - Can it hold up to field conditions?
    - weather
    - battery life
    - wireless signal
    - durability
  - How easy is it to use?
- Quality
  - Incomplete data, error rate

Pilot Test Phase II: Catch Data

- Catch Data
  - Selecting fish species
  - Recording number of fish
  - Recording weights/lengths
  - Grouped catch
- Productivity (Cost)
  - Interviews per assignment

Study Design – Phase I & Phase II

Pilot Test Phase I: Observational Data

- Fall 2010, Oct- Dec
- Delaware – 6 interviewers
- Data collected
  - Fishing site descriptions
  - Vessel observations
- 1st Generation iPad
- Web- based survey, SPSS Dimensions

Pilot Test Phase II: Catch Data

- Spring 2011, May-June
- MD/DE – 9 interviewers
- Data collected
  - Catch questions
- 1st Generation iPad
- Custom Apple app

Pilot Test Results: Quantitative

- Measures of productivity – Paper vs. iPad
  - Matched interviewers and timeframe
  - Paper – assignments with interviews
  - iPad – convenience sample…

Measure	Paper	iPad
Num of Asgn	104 (94 w/catch)	55
Mean # of Interviews	10.7	11.2
Mean # Catch Rec.	6.8	6.8
% with Length	87.5%	98.1%
% with Weight	81.4%	94.4%

Pilot Test Results: Qualitative

- Praise for the iPad
  - Easy to use
    - *Actually working with this unit is rather easy. It's so user-friendly; it tells when you've made a mistake.*
    - *Once the initial species and disposition is selected it seems quite a simple matter to select similar, and move right into the line for the next measurement.*
    - *Once confident, I started interviewing anglers, and it was much easier than I thought it would be.*
  - Ability to withstand field conditions
    - *The iPad did get wet, and seemed to handle it well.*
    - *The iPad was on for 4 hours, and only dropped 15% on battery life.*
    - *To enter the data I need to have one clean, dry pointer finger. I have found that this is quite doable, and measuring with 9 fingers is as good as 10.*

Pilot Test Results: Qualitative

- Praise for the iPad
  - Improved data quality
    - *I love the idea of all data being submitted in type written form … I also believe it will correct some of the mistakes that are made with entering data by hand.*
    - *…the images could be so very, extremely helpful for type 2 catch and release.*

Pilot Test Results: Qualitative

- Glare:
  - Many interviewers commented that they were unable to read the screen due to glare from the sun.
    - *It is hard to read in the sunlight; places with shade or cloudier days were easier.*
    - *The biggest problem I had was seeing the screen well when it was in direct sunlight. Once I memorized it, it was a snap.*
- Speed:
  - One interviewer claimed that the process of collecting data is slower on the iPad, and that data may be missed.
    - *… it slows you down to the point where you are going to miss gathering most of the data that you would expect to otherwise gather.*

Pilot Test Results: Qualitative

- Suitability to Field Conditions:
  - Difficulty holding the iPad
    - *I need something to hold it like a shoulder strap.*
    - *If you don't have a place to put everything, you have to juggle the I-pad, the measuring board, and scales.*
  - Concern about getting the iPads wet or dirty
    - *A lot of apprehension about getting it wet....so I am super cautious.*
    - *Other interviewers have reported that iPads that have gotten wet or dirty have not been damaged.*
  - Difficulty typing
    - *.. it is a bit tedious to type on this thing with two fingers.*

Pilot Test Results: Qualitative

- Program Issues: Interviewers made many recommendations as to how to improve the program, including:
  - Ways to make the screen easier to read
  - Resources they would like to have available on the iPad
  - Programming changes to make electronic data collection similar to the flow of paper data collection

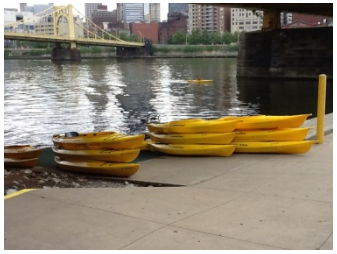
Cost Drivers

- Savings
  - Printing costs
  - Postage costs
  - Data entry costs
  - Staff time to investigate and resolve possible errors
- Expenses
  - Initial cost of iPads and accessories
  - Data plan for 3G connectivity
  - Programming

Quality

- Reduced interviewer error due to pre-programmed internal logic, ranges and skip patterns
- Data transfer from field directly to processing technician and database
- Staff enthusiasm for working with iPads

Pennsylvania (PA) Water Trails Economic Impact Study



Goal

Estimate the direct, indirect and induced economic impact of water trail visitors on Pennsylvania's economy.

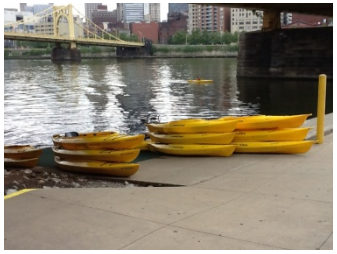
Method

Expenditure survey conducted through intercept interviews at randomly selected access sites.

Mode

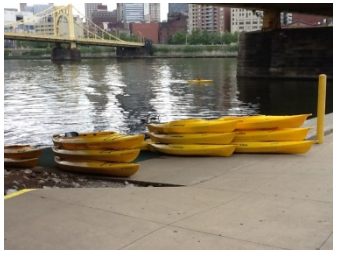
In-person interviews using iCAPI data collection via a customized Application with 2nd generation iPads.

PA Water Trails Results



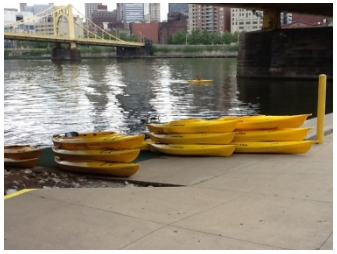
- 6 weeks of data collection during summer months
- Remote, rural and urban locations
- 7 iCAPI local interviewers
- Collected 350 in-person interviews

Anticipated Challenges



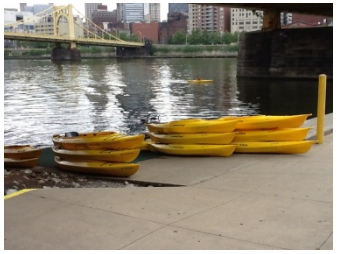
- **Time constraints** to develop and program a custom App
- **Training challenges** for staff unfamiliar with iCAPI and iPad technology
- **Ease of navigation** to remote and rural data collection sites
- Field **viability** of data collection device
  - Weather concerns (sun/rain/dirt)
  - Battery life
  - Connectivity and data transfer

Cost Drivers



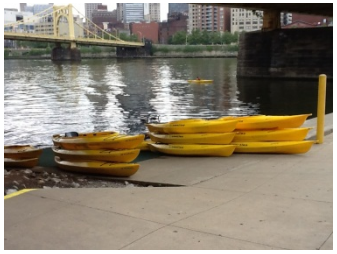
- Savings
  - Fewer training hours
  - Reduction in missed assignments due to improved navigation and communication tools
  - Efficient supervision of staff with real-time communication, iPad tracking, and Google Earth application
- Expenses
  - Initial cost of iPads
  - Data plan for 3G connectivity

Quality



- Reduced interviewer error due to internal logic, ranges and skip patterns programmed into customized App
- Ability to interview multi-person parties with in-progress surveys
- Data transfer from field directly to processing technician and database
- Data stored on iPad if connectivity was lost
- iPad tools offered value-added deliverables for clients
- Staff enthusiasm for working with iPads

Praise for the iPad



- Ease of Use
  - *The iPad and Water Trails application was a breeze to figure out. Even though I didn't have experience with iPads, I was able to pick up the technology really quickly and I found it really fun.*
  - *I really enjoyed using the iPad. I've done a lot of field interviewing with paper surveys, and I was skeptical at first because I thought it would be hard to juggle it while interviewing. I found, however, that people were interested in the iPad, which also helped to encourage people to talk with me.*
- Connectivity and Durability in the Field
  - *There were a few very remote locations, where connectivity was lost, however the surveys I completed at these locations were saved until I returned from the field.*
  - *Through heavy rainstorms and record-breaking heat, the iPad didn't appear to be phased by those conditions.*

Cost Lessons Learned

- iCAPI cost effectiveness depends on layers of scale
  - Project scope
  - iPad survey development and programming
  - Timeline of future iCAPI projects
- Geographic location and connectivity can be a driver for iCAPI survey design
  - Web-based survey
  - Custom application

Quality Lessons Learned

- Quality control measures consistently exceed paper methods
- iPads are flexible and durable for field data collection
- Interviewer learning curve is fast

Looking Ahead

- Will off-the-shelf iPad survey development software provide capability to design effective, tailored instruments?
- Does the depreciation of the iPad or other tablet technology present a cost-prohibitive driver for expanded use?

Questions?

Heather Driscoll

Principal

Heather.Driscoll@icfi.com

Autumn Foushee

Project Manager

Autumn.Foushee@icfi.com