

Development of a CARI Monitoring System for Bureau of Census

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FedCASIC

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** US Bureau of the Census*

Background of CARI* Work at Census

Latest of 3 CARI projects at Census:

- Methodological studies (2000 – 2003)
- Feasibility of recording. Development of a standalone prototype for monitoring (2004 – 2007)
- Implementation and behavior coding (2009 – 2011)

* *Computer Audio Recorded Interviewing*

Scope of Work

Software Development

Web-based monitoring system

- Behavior coding
- Quality assurance
- Inter-rater reliability tests
- Online training
- Automated assessment tool
- Tools for integration with BOC infrastructure

Scope of Work Regulatory

- FIPS-moderate standards
- 508 Compliance*

** System requires sight and hearing by its nature, so is not fully compliant*

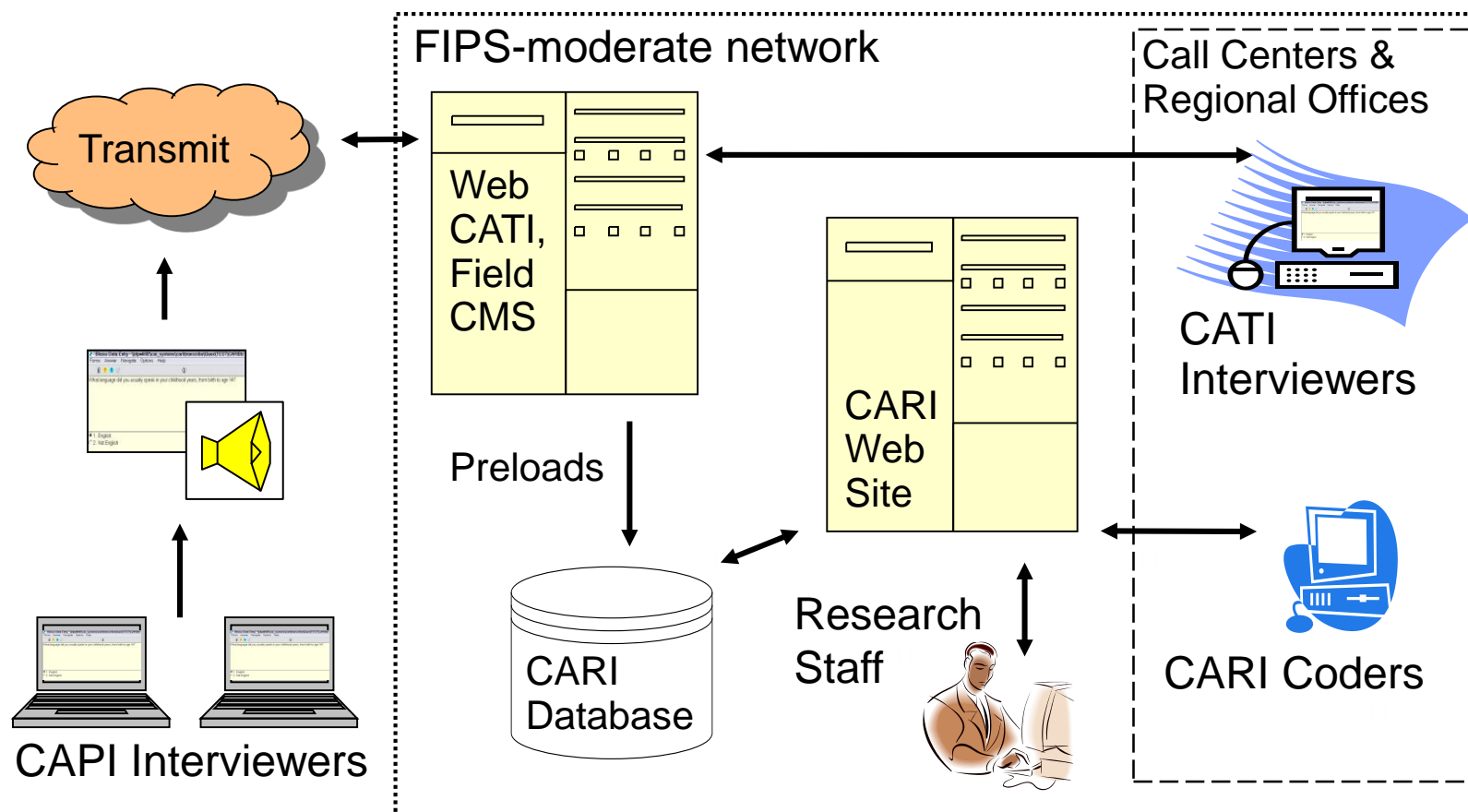
Census Bureau Context

- Want to do behavior coding on CARI files derived from CATI and CAPI sources
- System must allow easy modification of categories and codes for each new survey
- System must be integrated with current BOC infrastructure for data loading and authentication
- Need to be ready for behavior coding of the ACS Content Test, starting early 2011
- QA production use sometime in future

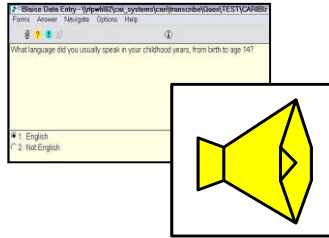
Field Data Collection,
Audio & Image Capture

Monitoring

CATI Data Collection,
Audio & Image Capture



Technology Details



- Audio recordings from CATI or CAPI through Blaise
- Image capture (screenshots) through Blaise
- Web-based monitoring system
 - VB.Net, ASP.Net,
 - Internet Information Server
 - Oracle
 - Data analysis tools
 - Media Player
 - Picture Viewer

Behavior Coding

What is It?

- Is Maria of Hispanic, Latino or Spanish descent?
- Um, I don't know. She's Mexican.
- Oh, so she's not Hispanic, Latino or Spanish?
- I guess not.
- OK, I'll put "No"

- I: failed to read response options
- R: commentary, confusion
- I: probed poorly, did not understand meaning of question
- R: uncertain response
- I: incorrect entry
- F: flawed

Behavior Coding: Why?

- Evaluate questionnaire design
 - Wording, phrasing, vocabulary
 - Readability, comprehensibility
 - Does the question get the kind of answer expected?
- Evaluate interactions between interviewer and respondent
 - Detect and reduce communication problems
 - Understand respondent reaction to questions (unexpected emotion such as hostility or laughter)

Quality Assurance: Why?

- Evaluate authenticity
 - Falsification
 - Major violations of protocol or professionalism
- Evaluate data quality
 - Conduct of interviewer (e.g. reading, probing)
 - Data entry (e.g. coded responses correctly)
 - Do the interviewers meet performance expectations for data quality?

System Roles & Functions

- **Coder:** Review audio and image files, assign codes
- **Supervisor:** Manage work assignments and coding progress, review reports
- **Research Manager and HQ staff:** Configure coding page, conduct inter-rater reliability studies, review coding, reports, audio & image data, extract data for analysis
- **Site Administrator:** Manage call center or regional office accounts and staffing
- **Security Administrator:** Review alerts, logs, reports
- **System Administrator:** Manage survey setup, load data, manage user accounts

Work Load Page

CARI

Interactive Data Access

User: coder003

Role: Survey Staff / Coder

Survey: BOC P&A Test 10

[Logout](#)




[Select Survey](#)

[**BC Work Load**](#)

Case workload for user: coder003

Show CompletedCases

Mark As Complete

Case ID	Notes	All Coded	Needs Review	Language	Status	Current Coder	Complete
BOC01004				1	Assigned to Coder	coder003	<input type="checkbox"/>
BOC01009				1	In Progress	coder003	<input type="checkbox"/>
BOC01011				1	In Progress	coder003	<input type="checkbox"/>

3 cases found

Coding Page

CARI
 Interactive Data Access

User: coder012 Role: Survey Staff / Coder Survey: ACS Content Test

<< Previous Next >> Save Reset

Survey ID:	ACS1234	Survey Name:	ACS Content Test
Case ID:	DisplayCaseID 5	Question ID:	SECT03.HOUSINGA.ACCESSST
Coding Status:	In Progress	Date/Time Last Saved:	04-JAN-10
Assigned Coder ID:	coder012	Assigned Coder Role:	Coder
Audio Link:		Audio Date/Time:	11/25/2009 08:41:27
Image Link:		Image Date/Time:	filedatetime
Data Collection Mode:	CAPI		

Reason For Not Coding:

Categories	Interviewer Behavior	Break-In
Interviewer	I-ES Exact Wording/Slight Change <input type="checkbox"/>	B-I Break-In <input type="checkbox"/>
Respondent	I-MC Major Change in Wording <input type="checkbox"/>	
Final	I-V+ Correct Verification <input type="checkbox"/>	
	I-V- Incorrect Verification <input type="checkbox"/>	
	I-O Omitted Questions <input type="checkbox"/>	
	I-IU Inaudible/Uncodable <input type="checkbox"/>	

Codes:

Notes:

Needs Secondary Review

Category	1	2	3	4	5	6	7	8	9	10	Notes
Interviewer	I-ES	I-O	B-I								✓ Edit
Respondent	R-IA	R-DK	L-M								✓ Edit
Interviewer	I-V-										✓ Edit
Respondent	R-R	L-PI	L-PR								Edit
Final	F-IE										Edit

Case Notes:

<< Previous Next >> Save Reset

For coding, we have to squeeze a lot of functionality into 800x600 screens.

Full system was shown in the demonstration room.

For more details, ask to see the system live.






Audio and Image Files

- Coders listen to the files as many times as needed to determine what codes to apply
- Coders also listen to determine what the appropriate response should be
- Coders code whether or not an accurate response was entered

Audio and Image Files



Forms Answer Navigate Options Help

Where did you spend your childhood years, from birth to age 14?

1. All or mostly in the USA
 2. All or mostly outside the USA
 3. A mixture of US and non-US locations

Sample Behavior Coding Categories - Interviewer

- Interviewer Behavior
 - Exact Wording/Slight Change
 - Major Wording Change
 - Correct Verification
 - Incorrect Verification
 - Omitted Questions
 - Uncertain Answer
 - Inaudible/Uncodeable
- Break-In

Sample Behavior Coding Categories - Respondent

- Respondent Behavior
 - Adequate Answer
 - Clarification
 - Uncertain Answer
 - Inaudible/Uncodable
 - Don't Know
 - Refuse
- Language
 - English
 - Spanish
 - Mixture of English and Spanish
 - Pronunciation Problems for Interviewer
 - Pronunciation Problems for Respondent

Sample Behavior Coding Categories - Final

- Correctly Entered
- Incorrectly Entered
- Reasonable Answer
- Unreasonable Answer
- Inaudible/Uncodable
- Don't Know
- Refusal

Quality Assurance Categories

- Still working out categories and codes
- Some candidate categories:
 - Authenticity (can we hear 2 voices?)
 - Reading (deviations, articulation)
 - Probing (good/bad)
 - Interview administration (speed, volume)
 - Conduct (professional behavior, proper tone)
 - Data entry, job aid usage

eTraining on Use of System

- Create automated training tool for system training
- Develop training material for how to perform behavior coding and quality assurance
- Manuals, user documentation, presentations
- Conduct training sessions at BOC offices
- In progress...

eTraining on Use of System

CARI Interactive Data Access	User: carlf Role: Survey Staff / Coder Survey: RTI Test 100
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[Logout](#)

[Select Survey](#)

[BC Work Load](#)

Welcome carlf,

There are training courses shown below, and some training courses have a brief quiz that you will need to complete.

To get started, please click on the first training course listed below, *Introduction*. After completing the first course, please proceed through the remaining courses in order.

Once in the training course, you can listen to the training audio by clicking on the yellow speaker symbol at the bottom of the first slide. To continue through the slides, you have a few options. You can click on the next slide name using the slide index; you can use the navigation arrows at the bottom of the page; or you can select "Slide Show" to view the slides and have the slides advance automatically for you.

After reviewing all of the training courses, please proceed with the certification quiz to finalize your training.

<u>Course Name</u>	<u>Viewed Date</u>	<u>Link to quiz</u>	<u>Score</u>	<u>Score Date</u>
Course 1: Introduction	2/26/2010 6:48:42 PM			
Course 2: Logging Into and Navigating the System		Quiz		
Course 3: Behavior Coding		Quiz		

Disclosure Prohibited - Title 13 U.S.C.

eTraining on Use of System

The screenshot displays an eTraining interface. On the left is a vertical table of contents with 10 items. Item 2, 'Course Objectives', is highlighted with a black background. The main area on the right is a light blue slide with the title 'Course Objectives' and a bulleted list of topics to be reviewed. At the bottom, a control bar includes a 'Slide Show' button, a 'Slide 2 of 10' indicator, and navigation arrows.

1 Course 1: Introduction to the CARI Interactive Data Access System
2 Course Objectives
3 System Components
4 System Components (cont.)
5 System Components (cont.)
6 Key Features of the System
7 Key Features of the System (cont.)
8 Your Role Using the System
9 Your Role Using the System (cont.)
10 END OF COURSE

Course Objectives

- In this course, we will review...
 - the components of the CARI Interactive Data Access System,
 - key features of the system, and
 - your role as a CARI coder.

Slide 2 of 10

Automated Assessment Tool

- Develop an automated assessment tool to gauge user's perceptions of the CARI system
- Perform assessment of:
 - Factors that are a burden to the user
 - Quality of the recordings
 - User perception of usefulness of the system
- In progress...

Security Issues

- System operates in FIPS-Moderate environment, subject to NIST SP800-53 controls
- Data subject to Title 13 protections
- Formal Certification & Accreditation process in accordance with NIST SP800-37

Future

- Behavior Coding component in testing now, final verification testing 7/2010
- Quality Assurance component testing starts 5/2010
- Full system complete 10/2010
- Production starts early 2011 for Behavior Coding

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