Building a CAPI Case management system for a small/medium size organization

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Overview

• Brief history of UWSC case management tools
  • How and why did we build our own system?
• Evolution to current system
  • Key features and components of current system
• Demonstration
• Q&A
• Go build / modify your own system
UWSC 101

• UWSC uses CASES 5.5 for CATI, CAPI, and Data Entry
  • Data stored in proprietary CASES data format
  • No field case management tools in 5 series

• We now do several CAPI projects each year, but for years we did CATI and mail only
Our first CAPI project in 1996

- How does a CATI organization manage a CAPI project?
- We’d like to use the CATI system we know
- But…CASES had no field case management tools…so we need to build our own
Essential CASES Programs

- OUTPUT: export data for fixed-width items to text files
- SHOWHIST: export data for open-ended items to text files
- MOVECASE: create archive files containing case data
- RELOAD: reload archive files containing case data

- If your system can do something like this you can build a system like the one we’re about to describe
Paleolithic case management tools
Crude but effective

Server

CASES
MOVECASE and
RELOAD

MS Office

Laptop

CASES
MOVECASE and
RELOAD
Modern Case Management Tools

Server

Laptop

Importer

Monocle

Transfer

Instrument

Database

Synchronization Folder

Instrument

Synchronization Folder

Case Report

Sync Script

Transfer
Prerequisites - Server
Prerequisites - Server

- Survey Instrument
  - CASES 5.5
  - Sample setup
- Database
  - MySQL
  - Schema configured for the study
  - Importer application configured to import data from survey into MySQL
- Synchronization folder structure
Importer Application
Importer Application

• Copies data from surveys into MySQL database
  • Makes data more readily available for case management and reporting tools

• Create text file containing survey data
  • Uses CASES programs OUTPUT and SHOWHIST
  • Only cases modified since last import
• Imports data from text files into MySQL
  • Creates or alters the MySQL table structure as needed
Importer

- Imports data for multiple projects
Import Processes

- Each process imports survey data into a single MySQL table
- A study may have multiple processes, importing data into separate tables
- Run in a separate thread every 5 minutes
- Import processes are defined in a MySQL table
  - Path to survey instrument
  - Name of files containing lists of variables to import
  - Name of table into which variables should be imported
  - Connection settings for database, with user and password encrypted
  - Run frequency
Import Monitor

• Perl script that runs continuously
• Runs on different server from the Importer
• Alerts users via email
  • Importer server is down
  • Idle processes
  • Errors encountered
  • When idle processes or errors are resolved
• Errors are typically caused by invalid items in variable lists
Monocle
Monocle

- Custom software developed at the UW Survey Center
  - Stand-alone application that sits on top of databases
  - Data-collection-tool agnostic
- Provides a (very-close-to) real-time view into a project’s data
- Used by project directors and supervisors
- Perform case assignment
Monocle – Login Screen

- Monocle has a login screen to allow users to connect to different studies
Monocle – Summary

![Monocle Summary](image)

1. CAPI Progress
   - Sample: 882
   - Worked: 882
   - Refusals: 7
   - Average Entries per Case: 10.66
   - Completes: 713
   - Ineligible: 113
   - Partial Completes: 0
   - Response Rate: 0.9272

2. Outcome Code Breakdown
   - Code 211: 1 - FIRST REFUSAL, BY INFORMANT
   - Code 212: 1 - FIRST REFUSAL, BY RESPONDENT
   - Code 213: 1 - FIRST REFUSAL, PARTIAL INTERVIEW
   - Code 221: 2 - SECOND REFUSAL, BY INFORMANT
   - Code 222: 2 - SECOND REFUSAL, BY RESPONDENT
   - Code 570: 2 - EMAIL/TEXT CONTACT
   - Code 600: 5 - NO ANSWER
   - Code 621: 2 - M.A.D. RESIDENTIAL OR UNCLEAR, MESSAGE LEFT
   - Code 631: 8 - M.A.D. NONRESIDENTIAL, MESSAGE LEFT
   - Code 632: 1 - M.A.D. NONRESIDENTIAL, NO MESSAGE LEFT
   - Code 711: 5 - INTERVIEW APPOINTMENT SCHEDULED
   - Code 800: 1 - NO ANSWER, NO MATERIALS LEFT
   - Code 810: 19 - RE-CONTACT BY INFORMANT, NO APPT SCHEDULED
   - Code 820: 1 - RE-CONTACT BY RESPONDENT, NO APPT SCHEDULED
   - Code 850: 2 - NO INFORMATION, TRY DIFFERENT NUMBER OR CONTACT INFORMANT

UWSC
University of Wisconsin Survey Center

19
## Monocle – Caselist Tab

![Monocle Caselist Tab](image)

### Table

<table>
<thead>
<tr>
<th>id</th>
<th>Assigned ID</th>
<th>O::ID</th>
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<th>Code</th>
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<td>9/20/2013</td>
<td>17:43:25</td>
<td>1</td>
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</table>
Monocle – Assign Case

Case 60009 is currently assigned to interviewer 100. You can reassign it to any of these interviewers.

Assign Cancel

Force Ownership to Server

Records selected: 1
Transfer Application - Server
Transfer Application – Server

• Manages files containing survey data
  • Used to copy data between server and laptops
  • Runs on the server and the laptops
• Scheduled task on the server
  • Configured to run every 5 minutes

• Creates and reloads files containing archived data from surveys
  • Uses CASES program MOVECASE to create files
  • Uses CASES program RELOAD to reload files, importing data into the survey instrument
• We refer to these as transfer files
Transfer File

- Contains an archive of all survey data for a single case
  - Includes all activity up to and including the most recent session
- File name is [caseid]_[user ID number].[session number]
Transfer - MySQL Data Structure

- Transfer uses MySQL tables
  - Case ownership and assignment
    - Assignment is managed on the server
    - Ownership is managed on the laptop
  - Information about most recent server session and most recent laptop session
Laptop Prerequisites

Server

Laptop

Importer

Monocle

Transfer
Prerequisites - Laptop

- Survey Instrument
  - CASES 5.5
- Synchronization folder
  - Used to upload/download files to server
- Laptop connects to MySQL server during synchronization
Case Report Application

Server

Laptop

Importer

Monocle

Transfer

Case Report
Case Report Application

- Application to manage cases on laptops
  - Used by interviewers and supervisors
- No internet connection required
  - Reads survey data on laptop
    - Uses CASES program OUTPUT
- Displays data for cases on laptop
  - Variable list customizable via configuration file
    - Outcome code
    - Respondent name, address, and telephone
    - Date and time of appointment
  - Appointment calendar
### Case Report with Practice Cases

<table>
<thead>
<tr>
<th>CaseID</th>
<th>Code</th>
<th>First Name</th>
<th>Last Name</th>
<th>Area</th>
<th>Prefix</th>
<th>Suffix</th>
<th>Appointment</th>
<th>Locked</th>
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<td>0801</td>
<td>Harry</td>
<td>Potter</td>
<td>608</td>
<td>111</td>
<td>1111</td>
<td></td>
<td></td>
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<tr>
<td>90002</td>
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<td>Harry</td>
<td>Potter</td>
<td>608</td>
<td>111</td>
<td>1111</td>
<td>5/12/2015</td>
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<td></td>
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<td></td>
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<td></td>
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</tbody>
</table>
Case Report – Appointment Calendar

The image shows a computer screen with a spreadsheet and a pop-up window for a calendar. The spreadsheet includes columns for CaseID, Name, Area, Prefix, Suffix, and Appointment. The pop-up window displays a calendar with specific dates highlighted, indicating scheduled appointments.

The spreadsheet contains details such as:
- CaseID: 90001, 90002, 90003, etc.
- Name: Harry Potter, Harry Potter, etc.
- Area: 608
- Prefix: 111
- Suffix: 1111
- Appointment Dates: 5/12/2015, 5/13/2015, etc.
Case Report – Case Summary

- Portal for opening case in survey instrument
- Selecting a case displays a history of case activity
  - Session date and time
  - Interviewer comments
- User entry-point for survey instrument
  - View summary before opening case
  - Confirm the caseid and respondent name
    - Reduce the likelihood of opening wrong case
Case Report – Confirm First Name

<table>
<thead>
<tr>
<th>CASEID</th>
<th>CODE</th>
<th>First Name</th>
<th>Last Name</th>
<th>Area</th>
<th>Prefix</th>
<th>Suffix</th>
<th>Appointment</th>
</tr>
</thead>
<tbody>
<tr>
<td>90001</td>
<td>01</td>
<td>Harry</td>
<td>Potter</td>
<td>608</td>
<td>111</td>
<td>1111</td>
<td></td>
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<tr>
<td>90002</td>
<td>21</td>
<td>Harry</td>
<td>Potter</td>
<td>608</td>
<td>111</td>
<td>1111</td>
<td></td>
</tr>
</tbody>
</table>

**Caseid: 90001**

**First Name:** Harry  
**Last Name:** Potter  
**CODE:** 0801  
**Area:** 608  
**Prefix:** 111  
**Suffix:** 1111

5/11/2015 8:53:40 AM  

no answer, left materials at door bbd//

Please enter the value of the item 'First Name' to confirm that this is the correct caseid.
Case Report – Configuration

• Configuration file contains study-specific settings
  • Path to survey on laptop
  • Variable definitions
    • Item name in survey instrument
    • Variable label
    • Value labels for numeric data
  • Default font name and size
Case Report – User Configuration

- User-specific settings contained in separate file
  - Column sequence
    - Users may drag and drop columns
  - Preferred font name and size
  - Filters to display or conceal cases
    - Held cases
      - Cases reassigned to other interviewers
    - Non-entry cases
      - Completed interviews
      - Other final outcomes
Synchronization Script

- Batch file on laptops
- Synchronizes files between laptop and server
- Run on demand by the interviewer
  - Daily, or at request of supervisor
- Requires VPN connection to server
- Uses rsync program to copy files
rsync Program

- Third-party application
- Synchronizes contents of a folder on the server with its corresponding folder on the laptop
  - Transfer files containing survey data
  - Latest version of instrument from server
  - Audio files
  - Images
- Only copies files which have been modified
  - Compares server and laptop directories
    - File size and timestamp
Synchronization Script – Sequence

• Download from Server
  • Run rsync program
    • Download transfer files from server
  • Run Preflight batch file
    • Copy survey instrument to laptop
      • Initial deployment
      • Updates while in field
    • Copy shortcuts to desktop
    • Copy applications and configuration files to laptop
  • Run Transfer Application
    • Reload transfer files downloaded from server
    • Create transfer files to upload to server
Synchronization Script – Sequence

- Upload to Server
  - Run rsync program
    - Upload transfer files to server
    - Upload pictures and audio files
  - Run Postflight batch file
Transfer - Laptop

Server

Laptop

Importer

Monocle

Transfer

Case Report

Sync Script

Transfer
Transfer – Laptop

- Invoked by the synchronization script
- Manages files containing survey data
  - Processes the files copied by rsync

- Creates and reloads files containing archived data from surveys
  - Uses CASES program MOVECASE to create files, exporting data from the survey instrument
  - Uses CASES program RELOAD to reload files, importing data into the survey instrument
Transfer – Case Assignment and Ownership

- **Assignment**
  - ID of user to whom case is assigned
  - Supervisors assign cases on server

- **Ownership**
  - ID of user who currently owns case
  - Transfer program manages ownership on laptops
    - Relinquish ownership of cases no longer assigned to user after uploading data
    - Take ownership of cases assigned to user if those cases are not owned by other users
Transfer – Case Ownership

- Strict case ownership model
  - Prevents conflicts when a case is reassigned
    - Original owner must synchronize to relinquish ownership of the case before newly assigned interviewer can assume ownership
  - Only one interviewer can access a case
Transfer – Setting and Clearing Holds

• Transfer program puts cases on hold when they are no longer owned by interviewer
  • Uses CASES program MANAGER to set and clear holds
  • Cases on hold concealed by Case Report
    • Cases on laptop are never deleted
    • Cases held if no longer owned by interviewer
Transfer Logs

- Date and outcome of transfer sessions
  - Text files on laptop and server
  - MySQL tables on server
Transfer Logs

- Transfer activity for individual cases
- MySQL tables on server

<table>
<thead>
<tr>
<th>autoid</th>
<th>csid</th>
<th>user_id</th>
<th>event_date</th>
<th>event_text</th>
<th>event_error</th>
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System Summary

Server

Laptop

Importer

Monocle

Transfer

Case Report

Sync Script

Transfer
Tool Summary

- Server
  - Survey instrument
  - MySQL database
  - Importer
  - Import Monitor
  - Monocle
  - Transfer program
  - Synchronization folder

- Laptop
  - Survey instrument
  - Case Report
  - Transfer program
  - Synchronization folder
  - Synchronization script
  - rsync program
System Features

- Customizable
- Scales well
  - Server load
- Case-level granular management capability
- Meta-data on processes
  - Aid with support and debugging
- Fault tolerant
  - Transfer files function as archives to reload data
  - rsync tolerates interruptions
  - Data are not deleted from laptops
Questions?
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For copies of this presentation or more information, please contact us at bday@ssc.wisc.edu, cschlapper@ssc.wisc.edu, or ewhite@ssc.wisc.edu

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