A Technical Solution for a Mixed-Mode Study

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Study Background

• Pre/Post Deployment Study
  – Longitudinal Study
    • T0 Pre-Deployment (group, self-administered web, blood)
    • 9-month deployment
    • T1 Immediately upon return (group, self-administered, paper, blood)
    • T2 ~60-90 days after return (group, self-administered web)
    • T3 ~9 months after return (web/phone)
      – Current and former members of the U.S. Army (N=~9,000)
      – CIDI (mental health) instrument, self-administered web (Blaise IS) or interviewer-administered phone (Blaise 4.8)
        » Overlapping, but not identical instruments
      – Fielded June 24, 2013 – April 30, 2014
      – Incentive up to $50
PPDS T3 Design

• Cases assigned to one of two modes web (majority of cases) and phone
• Mode switches built-in (cases move on a flow basis)
• A case is available/accessible in either mode until finalized
• When a case switches modes, incomplete sections are re-administered in the current mode to keep reference period the same within a section
• Varying release schedule
• Experiments
  – Beginning mode
  – Pre-notification contact mode
  – Web to phone switch timing
• Contact types
  – E-mail
    • Web survey invitation, reminder(s) → outbound
    • Bounced, participant sends/replies → inbound
  – SMS text
    • Notifications → outbound
    • Bounced, participant sends/replies → inbound
  – Phone
    • Interviewer calls → outbound
    • Participant calls → inbound
  – Mail
    • Pre-notification, persuasion, thank you → outbound
    • Undeliverable, participant replies → inbound
System Components

- Utilizes - SQL server, ColdFusion, C#.Net, T-SQL
  - Web based - manages case attributes, dynamic reporting and querying, tracking updates
  - Windows batch process - delivers files to the Blaise SMS
  - Windows programs
    - EMailer - sends e-mails and logs undeliverables
    - SMS Text Module – sends text messages
  - Extensive use of SQL Server procedures for batch processing
System Architecture: Overall System
System Architecture: Management System

- Manages contact protocol (e-mail, text, mail)
- Manages web mode
- Manages mode switch protocol
- Manages tracking protocol
- Manages payment protocol
- Manages safety protocol

- Activates sample
- Stores comprehensive contact history (phone calls, e-mails, text messages, letters)
- Stores contact information
- Displays study progress
System Architecture: Web/Phone

Management system delivers text file to Blaise SMS
- Tracking leads
- Cases completed on web
- Cases to activate phone

Respondent logs on to web portal
- Web Portal authenticates against credentials in management system.

Web Survey Portal
Redirects to Blaise IS web survey upon successful authentication

Blaise SMS updates management system staging tables every 3 minutes
- Non-working numbers
- Cases completed on phone
- Cases to activate web

Management System

SQL Server

Web (BlaiseIS)

BlaiseIS BDB

Phone (Blaise 4.8)

Blaise 4.8 BDB

Manipulate read/write data from/to
System Architecture: E-mail Module

- Checks (crawls) study e-mail account inbox (used to send batch e-mails) to identify bounced e-mails
- Identifies bounced e-mail, categorizes (bounced reason), and writes status to MS.
- MS processes information. If all e-mail addresses have bounced for a case, the case is flagged to switch to phone immediately if valid phone numbers are available. If case does not have valid phone numbers, the case is flagged for tracking.

- Interfaces with MS to identify pending e-mail requests and sends e-mails
- MS delivers template variable (12 different templates)
- Logs send time, send result and writes information back to MS.
- Places secret token in e-mail header to identify bounced e-mails
- Sends e-mails at controlled speed (configurable) to reduce likelihood of e-mails being flagged as SPAM.
System Architecture: SMS Text Module

- Interfaces with MS to identify pending text message requests and sends the requests to Aerialink Server via Aerialink API
- Send text request includes template variable (2 templates) from MS
- Aerialink servers send text messages and log status
- Logs the send time, send result and writes it back to MS

- Provides project staff ability to send text messages (manually or defined template)
- Sends request to Aerialink Server via Aerialink API
- Aerialink server sends message and logs send result
- Logs send time, send result and writes it information back to MS
Lessons Learned

• Interviewer needs access to all contact attempts
  – Did not have access to e-mail, SMS attempts in CATI
  – Having additional context is helpful when talking with participant

• All inbound contacts need to be logged/recorded by the system
  – Inbound SMS text messages were not logged by the system

• One management system managing all aspects is more efficient than multiple systems managing specific aspects
  – Eliminates pushing data back and forth between multiple systems