



Army Study to Assess Risk and Resilience in Servicemembers

# A Technical Solution for a Mixed-Mode Study

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Army Study to Assess Risk and Resilience in Servicemembers

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  - Co-PIs: R. Ursano (USUHS) & M. Stein (UCSD)
  - Site-PIs: R. Kessler (HMS) & S. Heeringa (UM)
  - Collaborating NIMH Scientists: L. Colpe & M. Schoenbaum
  - Consulting Army Scientists: K. Cox & S. Cersovsky

# 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

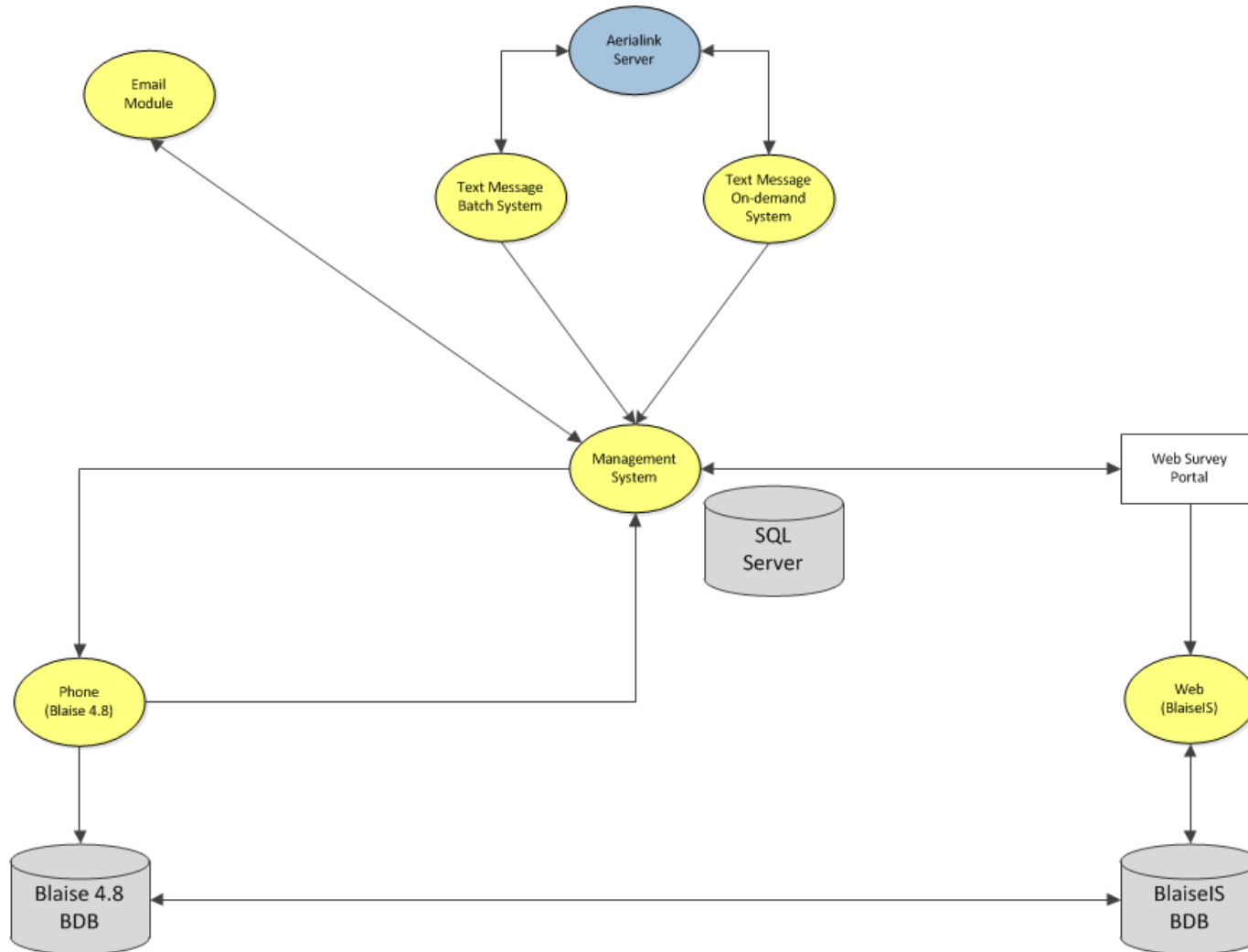
- Cases assigned to one of two modes web (majority of cases) and phone
- Mode switches built-in (cases move on a flow basis)
- A case is available/accessible in either mode until finalized
- When a case switches modes, incomplete sections are re-administered in the current mode to keep reference period 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

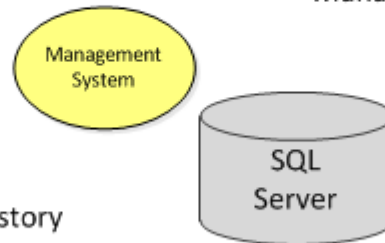
- Utilizes - SQL server, ColdFusion, C#.Net, T-SQL
  - Web based - manages case attributes, dynamic reporting and querying, tracking updates
  - Windows batch process - delivers files to the Blaise SMS
  - Windows programs
    - Emailer - sends e-mails and logs undeliverables
    - SMS Text Module –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

# System Architecture: Overall System



# System Architecture: Management System

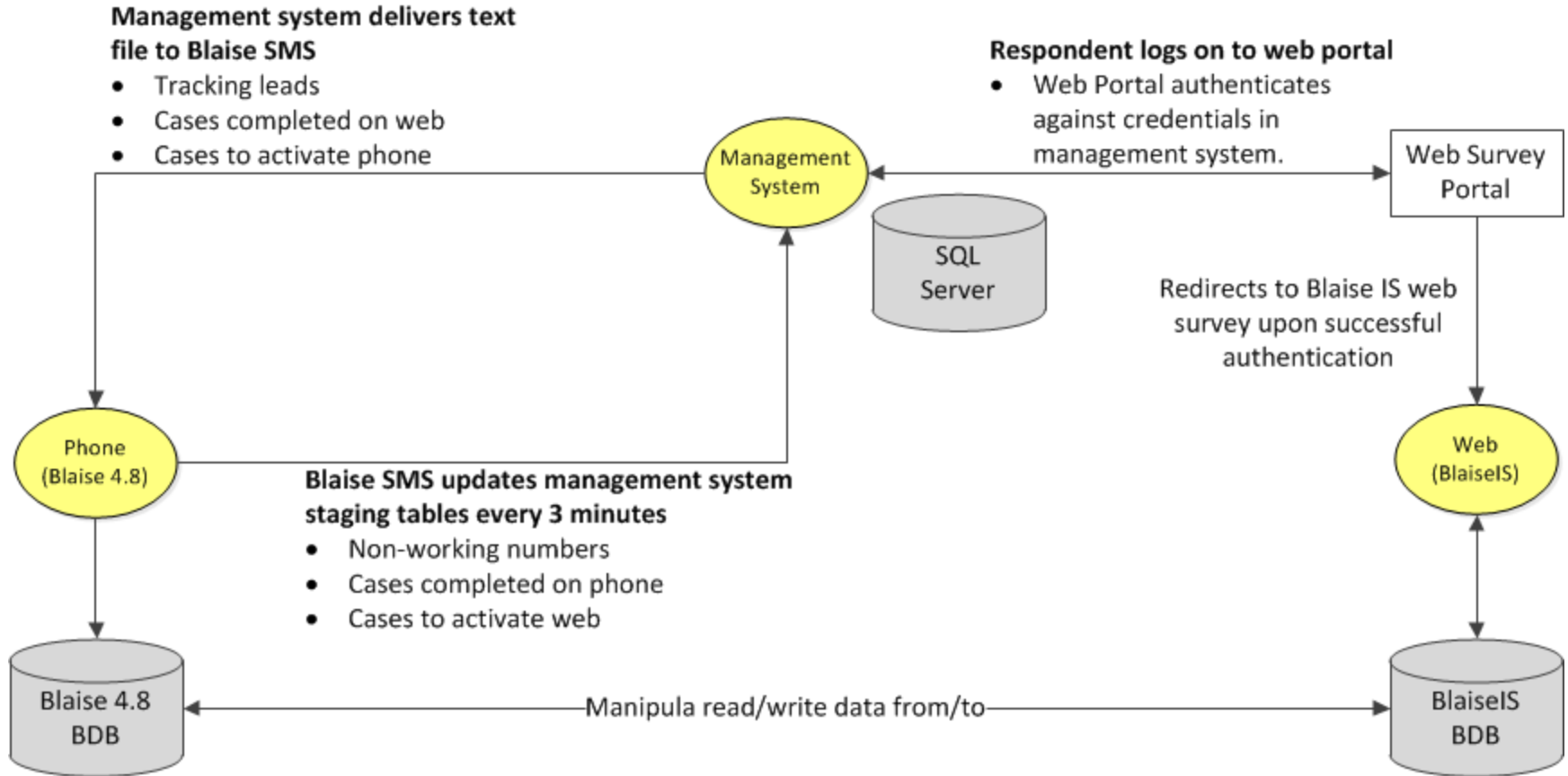
- Manages contact protocol (e-mail, text, mail)
- Manages web mode
- Manages mode switch protocol
- Manages tracking protocol
- Manages payment protocol
- Manages safety protocol



- Activates sample
- Stores comprehensive contact history (phone calls, e-mails, text messages, letters)
- Stores contact information
- Displays study progress

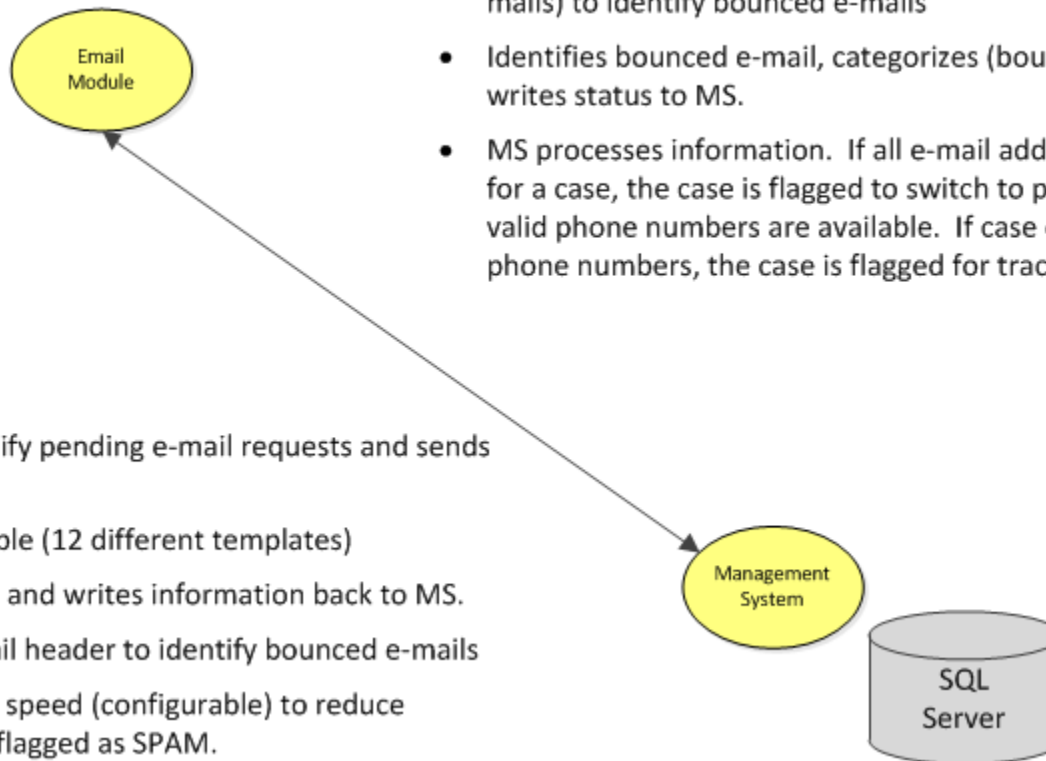


# System Architecture: Web/Phone



## System Architecture: E-mail Module

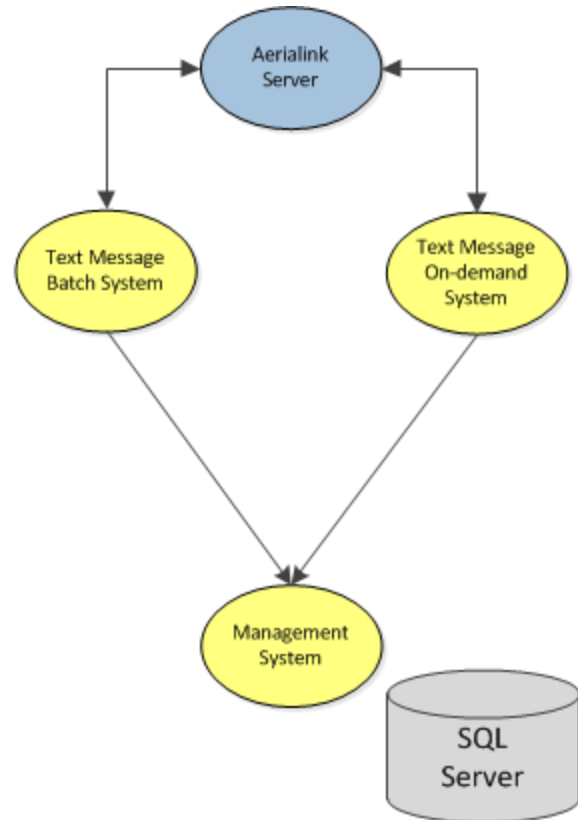
- Checks (crawls) study e-mail account inbox (used to send batch e-mails) to identify bounced e-mails
- Identifies bounced e-mail, categorizes (bounced reason), and writes status to MS.
- MS processes information. If all e-mail addresses have bounced for a case, the case is flagged to switch to phone 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)
- ends 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