2004 Census Test

Mobile Computing Device Initiative
High Level Design and Functionality

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2004 Census Test
Mobile Computing Device Initiative

- Prototype System
  - Software Applications
  - Telecommunications System
  - Hardware
- High Level Design
  - Based Computer Assisted Personal Interviewing (CAPI) Model
- Limited Implementation for 2004 Census Test
  - One field operation (NonResponse Followup)
  - Functionality

2004 Census Test
Mobile Computing Device Initiative
High Level Design

- Mobile Computing Device (Handheld)
  - Standalone device used by enumerators
  - Custom applications to collect short form data
  - Dial-up data transmission capability
- Operations Control System (OCS)
  - Client/Server Architecture
    - UNIX database servers – HQ
    - Desktop clients – Local Census Office
  - T1 Connection via Bureau Wide Area Network
  - Custom applications to manage field operations

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High Level Design

- Telecommunications
  - Dialup Afaria System (MCD data transfer to HQ)
  - T1 capability (Local Census Office to HQ)

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Field Implementation

- Non-Response Followup Field Operation
  - Field Staff Training April 2004
  - Enumeration April –July 2004
  - Approximately 1000 Field Enumerators
  - Local Census Offices
    - » Queens, NY (New York Region)
    - » Thomasville, GA (Atlanta Region)

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System Features

- Electronic capture of respondent data
  - Edits and Logic
  - No clerical edits
- Daily transmissions of work completed
- Ability to reassign work
- Ability to capture GPS coordinates
- Electronic map displays with “You Are Here” indicator
- Daily notification of late mail returns
- Ability to add living quarters not identified in assignment area

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System Features

- Extensive management reporting on field activity
- Facilitates timely review/reassignment of partials, refusals, insufficient data cases
- Electronic capture of reinterview data
- Facilitates timely reconciliation of suspect reinterview cases

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Integrated Components – Control System

- Operations Control System
  - Client/Server Architecture
  - Powerbuilder front end (Local Census Offices)
  - Oracle/UNIX database servers (HQ)
  - Oracle stored procedures and C programs
  - Critical operational and management tool for LCO
  - Allows LCO to control and track work in the field
    - Extensive reporting capability on field activity
    - Allows for assignment & reassignment of work
    - Timely review/reassignment of partials, refusals or cases with insufficient data
    - Facilitates reinterview operation

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Integrated Components - Telecommunications

- Afaria Telecommunications System
  - 56k Direct Dial Up System
  - Connection/Authentication via RADIUS server
  - Xcellenet Afaria software for file transfer
  - Redundant systems (Bowie and Suitland)
- Security
  - Secure Socket Link (SSL) during data transmissions
  - Windows Domain Authentication through Radius server
  - MCD access only to servers in DMZ
  - Once connection establish, HQ servers take over processing
    - No interactive access by MCD

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Integrated Components - Telecommunications

- Transmission Process
  - Enumerator device initiates transmission
  - Authentication through RADIUS server
  - HQ system pushes new software to device (if needed)
  - HQ system pushes new assignment or late mail return data
  - HQ system pulls completed work from enumerator device
  - Process transmission log/message to enumerators

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Integrated Components - MCD

- Mobile Computing Device
  - COTS Solution
    - IPAQ 3950
    - Holux GPS Receiver
    - MS Pocket PC Operating System
    - File Crypto Data Encryption
    - Pccillian Virus Protection
    - Arc Pad Mapping Software
    - Afaria Telecommunications Client

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Integrated Components - MCD

- Software Development Environment
  - Microsoft's .NET implementation
  - Application Development
    - C# (Visual Studio)
      - » Assignment Management
      - » Instrument
    - ESRI ArcPad
      - » Map Displays
    - Xcellenet OneTouch
      - » Telecommunications Scripts
  - Database – Microsoft SQL Server CE
  - PVCS Tracker

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Integrated Components - MCD

- Automated Short Form Questionnaire
  - Edits and Logic
  - English and Spanish Versions
- GPS
  - Capture GPS coordinates (3 meter accuracy)
  - Displays assignment area maps
  - Displays “current position” symbol on maps

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Integrated Components – MCD

- Assignment Management
  - Tool for enumerators to manage workload
  - Add new unit capability
  - Transmissions
    - Initial Assignments, Reassignments, Late Mail Returns
    - Preset or Immediate
  - Reinterview/quality control operations
  - Training Component – "Practice Cases"
  - E-Mail from Local Census Office (read only)

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Integrated Components - MCD

- Security
  - Password Protection
    - Login and Transmission passwords
  - Virus Protection
  - Inactivity Screen Locking
  - Data Storage
    - Data on device and secure disk (SD) card encrypted
      - » Fsecure Filecrypto
    - All Title 13 Data
    - FIPS 140 Compliant
  - Data Transmissions
    - Secure Socket Link (SSL)
    - FIPS 140 Compliant

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Testing Process

- Alpha Testing
  - Development Staff
- Instrument Path Testing
  - DSSD quality/subject matter experts
- Integration Testing
  - TMO Software Testing Staff
- Systems Testing and User Acceptance Testing
  - TMO Software Testing Staff
  - Field Division
  - DSSD Path Testers
  - Beta Site

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Support

- Tiered Approach
  - Crew Leader
  - LCO Help Desk
  - LCO Assistant Manager for Technology
  - Regional Office Computer Specialist
  - HQ Technical Assistance Center
  - Developers/Systems Staff
- Ticket Tracking
  - Remedy Help Desk Tool
- Service Level Agreements