DCAS
Data Collection Application Suite
www.dcasproject.org

What is DCAS?

DCAS (Data Collection Application Suite) is a government-owned suite of applications for health studies support. DCAS was initially developed for the CDC and significantly enhanced to meet the National Children's Study (NCS) needs. DCAS bridges all elements of a health study, including content development, data collection, data management, and data delivery.

Major Functions

- *Content Authoring & Management* – **DCAS Metadata Editor** facilitates building and maintaining survey content
- *SMS (Study Management System), Participant Management, Scheduler integration* – **DCAS Open API** allows for integration with multiple SMS systems including SugarCRM, PSC (Patient Study Calendar) and others
- *Data Collection* – **DCAS Data Collection Instruments** can run on multiple platforms including PC, Web, Tablets and iPad for collection of study data (online/offline) using survey content designed in DCAS Metadata Editor
- *Data Export* – Export data for transmission from local tablet to a study center; data delivery from a study center to the NCS Program Office via XML conforming to the MDES specification
- *Data Quality Control* – **DCAS Web Viewer and Data Editor** allows review, research, annotation and editing of collected data; enforces data quality via metadata driven constrains and checks and integrates with statistical tools (SAS)

NCS Achievements/Outreach

- DCAS has been used for data collection in the **Vanguard Study** by the original 7 Study Centers
- **DCAS Data Collection Instruments** are being used by a number of NCS Study Centers with different recruitment strategies
- **Production** study data has been collected and submitted to the Program Office using DCAS tools
- DCAS **Open API** (REST, SOAP and MVC) promotes collaborative development between Study Centers and the MIMS IT contractor
- DCAS is suitable for any **recruitment strategy** – Provider Based, Hi/Lo and Enhanced Household
- DCAS is a **FISMA compliant** tool

Benefits of Using DCAS

Scalability

- Handles instruments of all sizes and complexity - from simple, informed consent wrappers to interview questionnaires with several hundreds or thousands of questions, including rosters, grids, loops, sophisticated skips and reconciliation
- Produces questionnaires as well as specimen, environmental and physical measurement components

Agility

- Updates to instruments, such as adding or removing questions, can be done quickly through the DCAS Metadata Editor by a content developer or content author
- One click deployment of updated content to a data collection device can be performed by a content developer
- Delivery of different versions of metadata to the field with a short turnaround time

Accessibility

- The primary output of DCAS is a direct representation of the content in the metadata repository
- Any version of the content is easily accessible to study stakeholders in real-time
- Metadata is accessible via Metadata Editor, Web Viewer, and DCAS Open API

DCAS NCS Life Cycle

The DCAS Life Cycle starts with the creation of metadata (based on the Program Office specifications) by multiple content developers working simultaneously and its deployment to one of the DCAS Data Collection platforms. The Data Collector (or Respondent) collects study data and the system synchronizes the data with the central repository. The Study Manager performs quality control and exports data into the MDES format for submission to the Program Office VDR database.
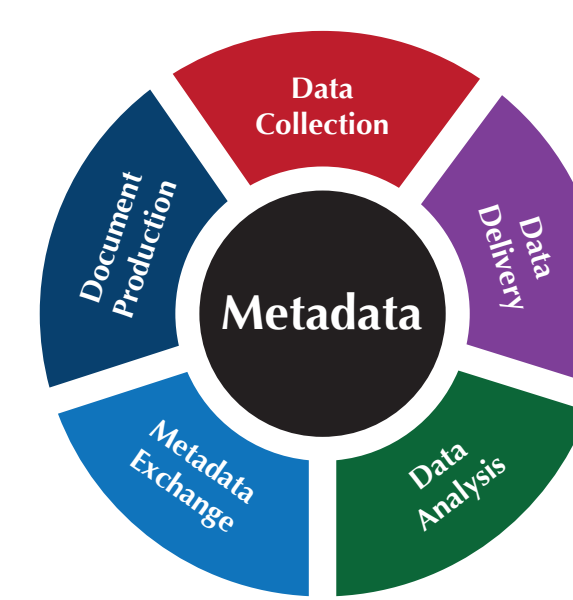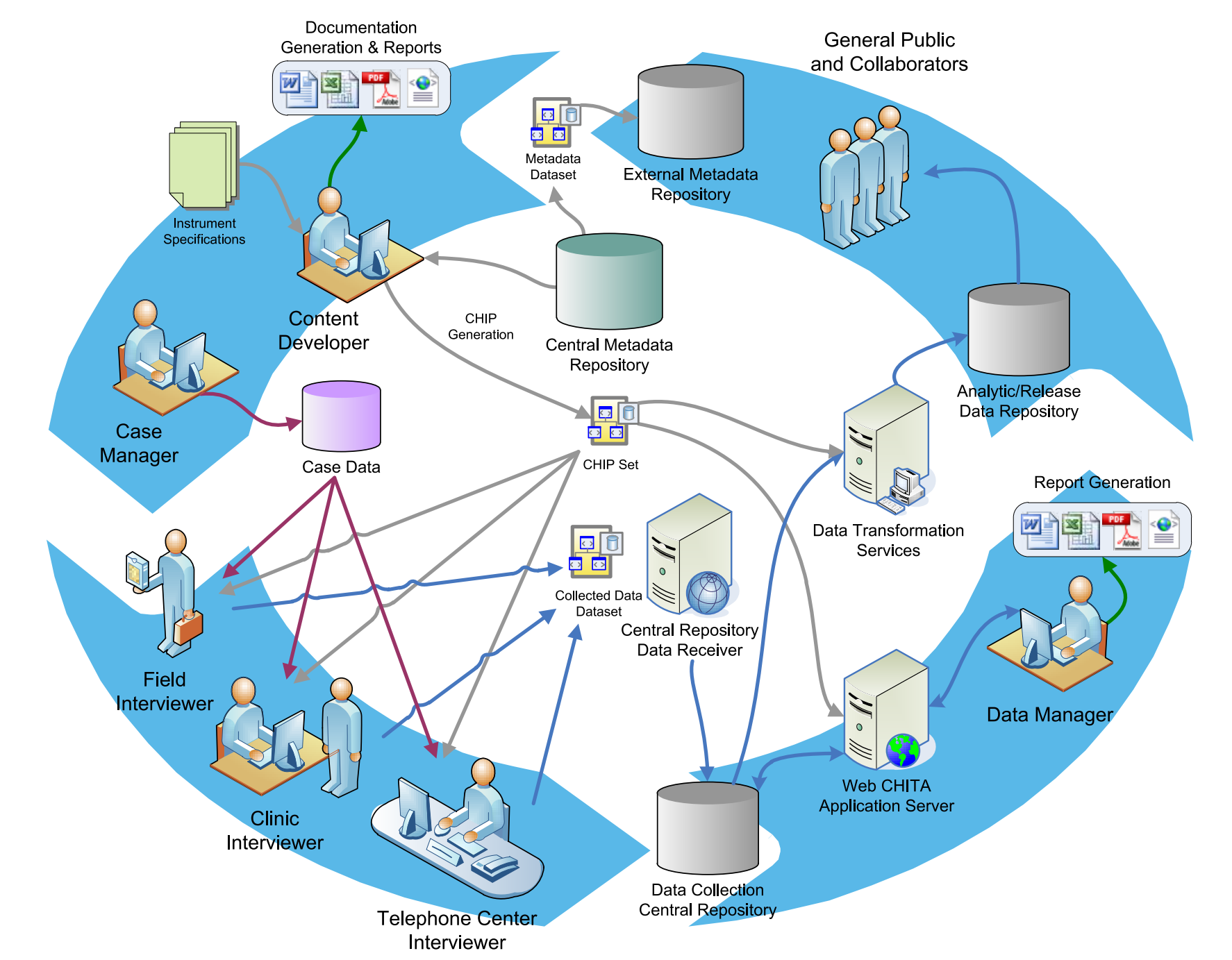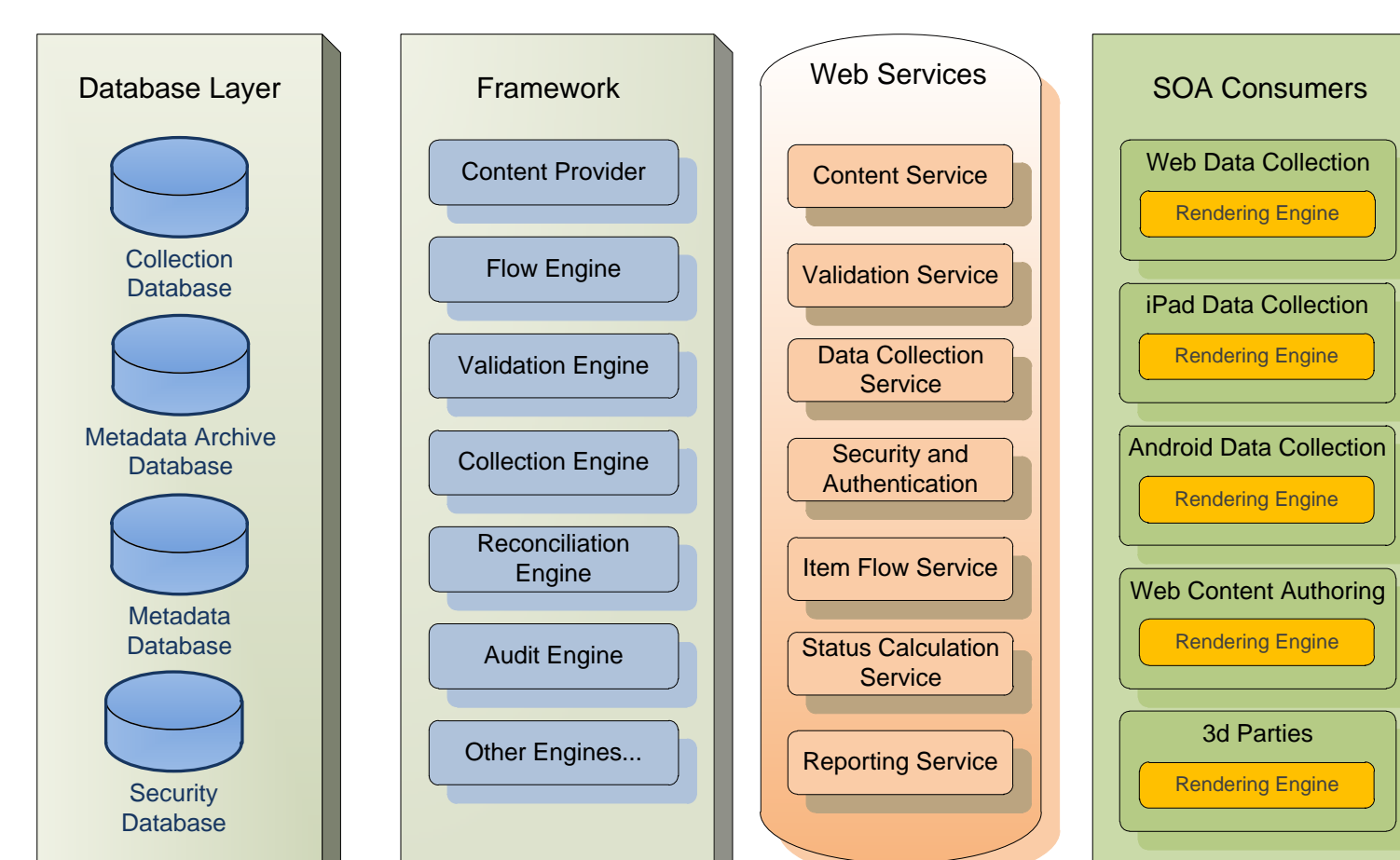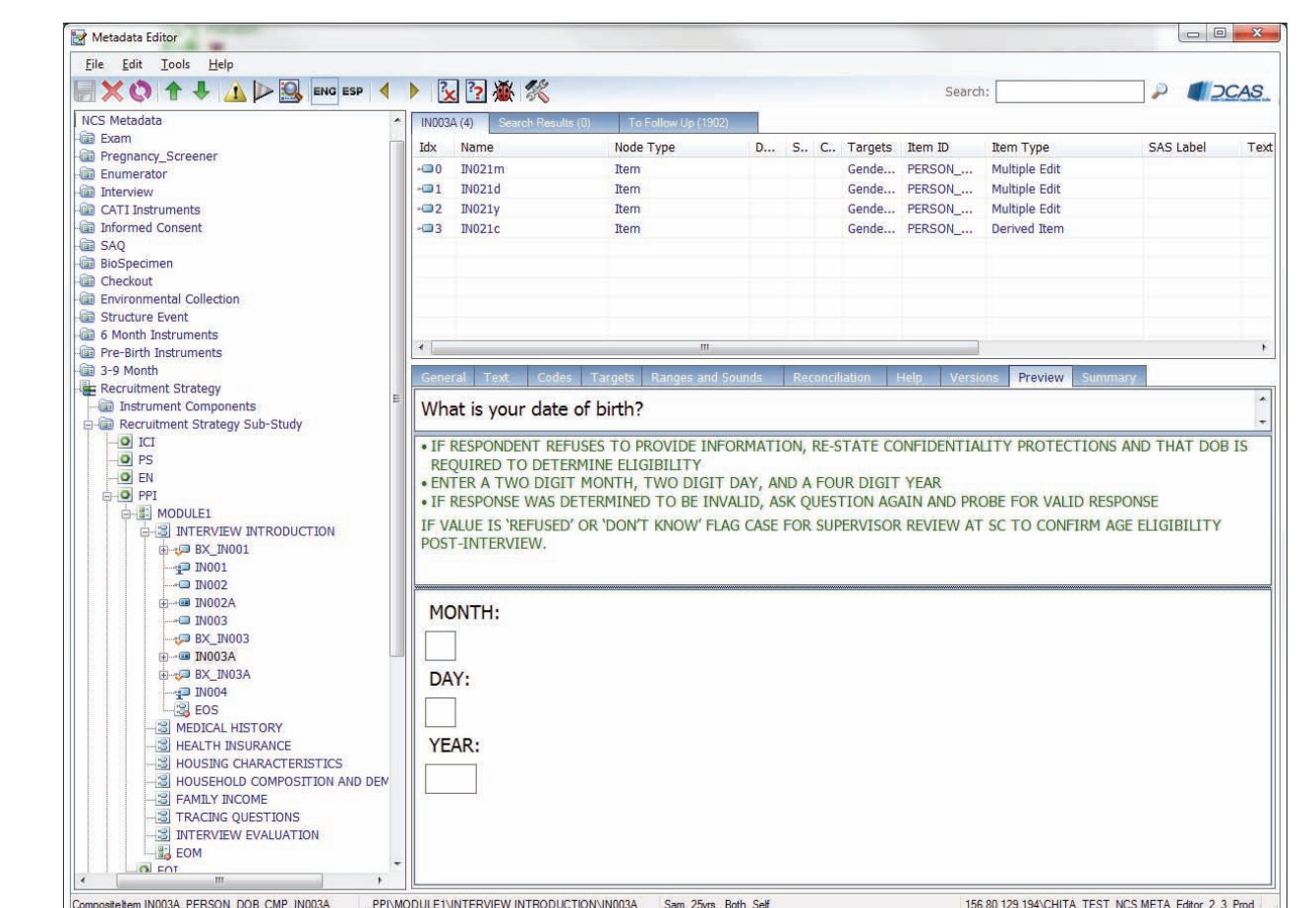

DCAS Metadata

- Transparency (easy visibility by both technical and non-technical users)
- Maintainability (easy GUI for both technical and non-technical users)
- Robustness (contain all elements and hierarchy to describe necessary processes and data)
- Documentability (to produce user friendly reports)
- Extensibility (easily extent metadata structure to add new elements)
- Exchangeability (easy exchange between repositories in distributed environment)
- Standardization (to support health standards)

DCAS Metadata Editor

- Content is entered by non-technical personnel
- All instrument logic is represented via metadata making it transparent to study stakeholders (none of the logic is hard coded or hidden in the data collection application)
- Has built-in instrument versioning
- A content author can preview "on the fly" what the participant, data collector, or data manager will see
- Enables content reuse
- Supports "one click" deployment

DCAS SOA Architecture

- DCAS supports SOA architecture by exposing all key DCAS functions including Data Collection and Metadata Management
- DCAS Services are based on industry standard cross-platform Web Services and Frameworks REST, SOAP and MVC
- DCAS Services will allow data collection on multiple platforms including iPad and Android (under development) as well as integration with multiple SMS systems

Case/Participant Management

DCAS Field Starter
- Enables respondent management in the field
- Controls instrument execution
- Synchronizes data with central server

DCAS - SMS integration
- Integration with SugarCRM for participant and event management
- Integration with PSC for participant and scheduler (under development)
- Central management of respondents and events
- Public API for integration with third party Data Collection, Case and Participant Management tools
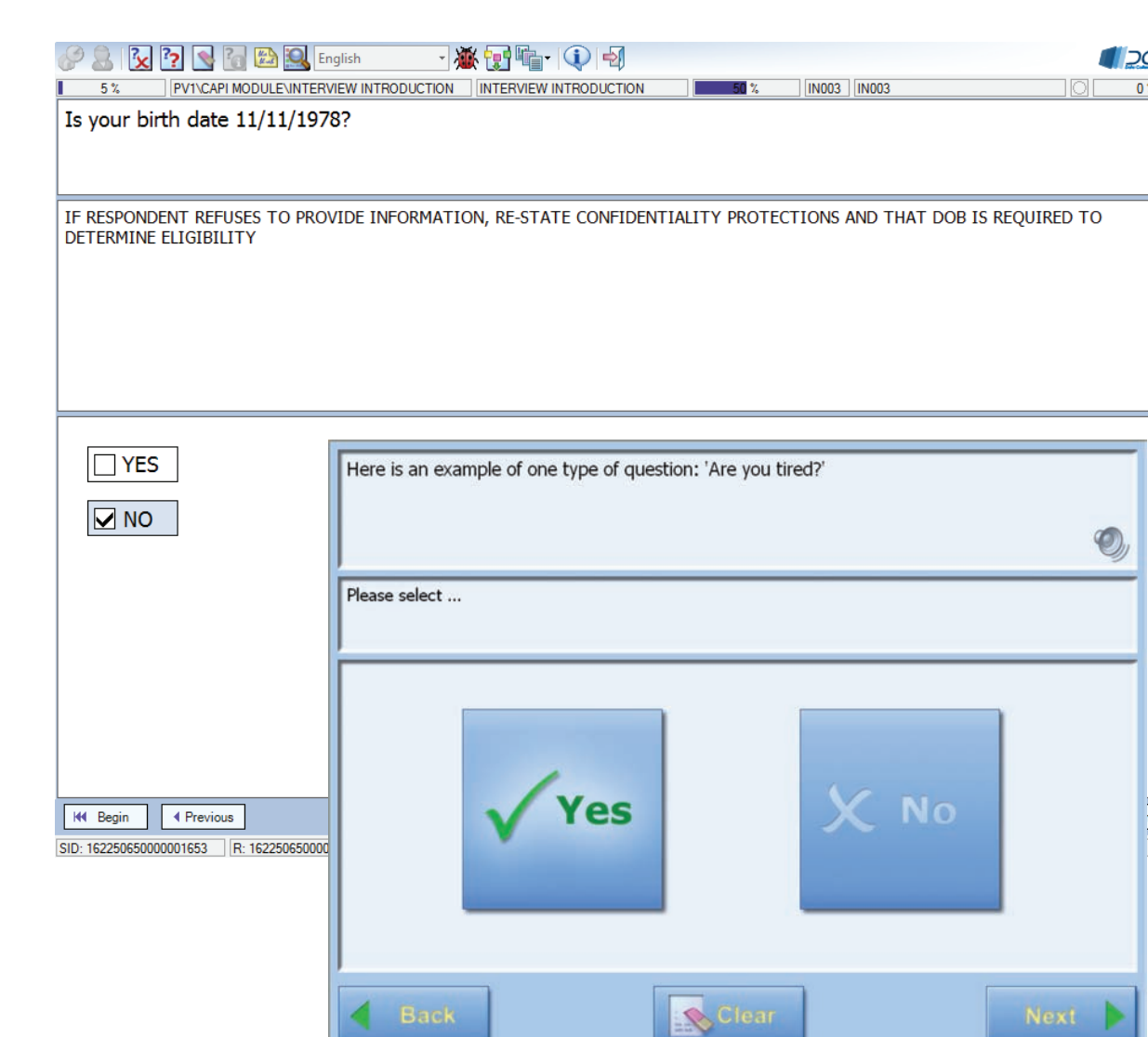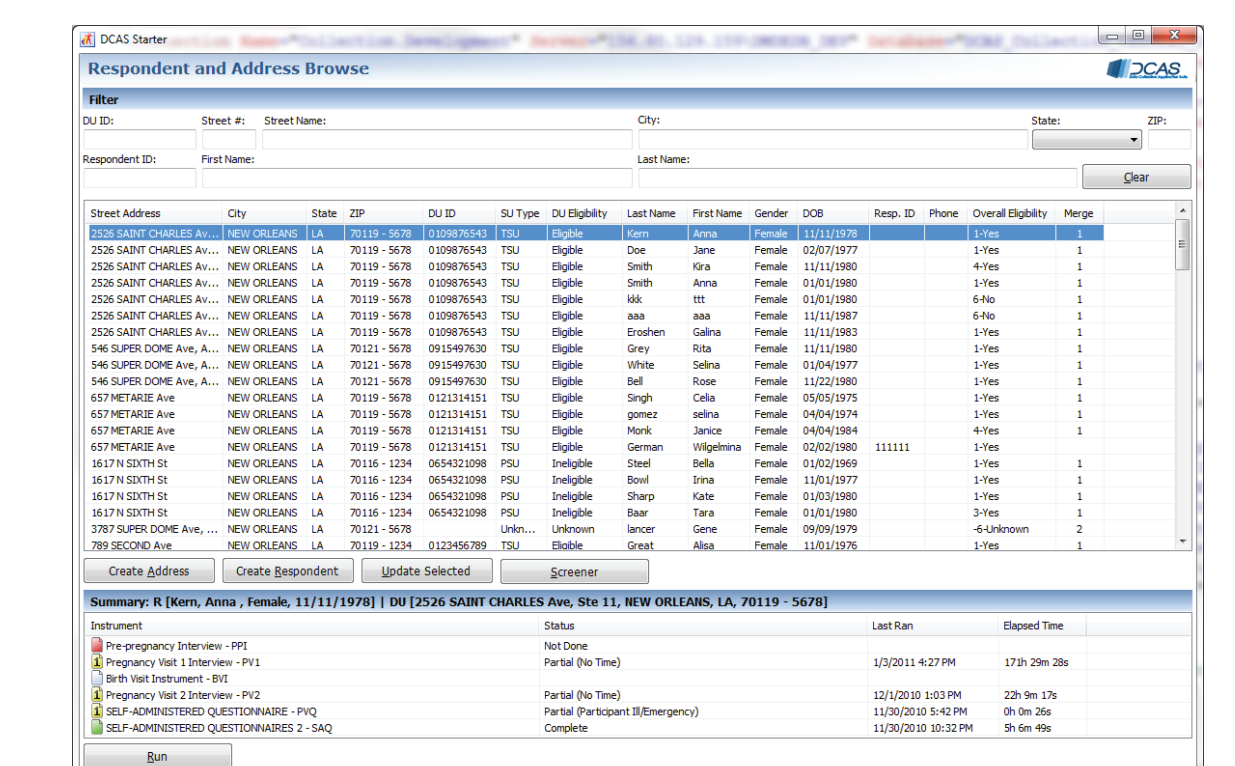
Field Data Collection

DCAS Data Collection
- Offline (Windows only) and online modes
- Support of complex data collection patterns
- Multiple data collection modes– CAPI (Computer Assisted Personal Interview), ACASI (Audio Computer Assisted Self Interview), CATI (Computer Assisted Telephone Interview)
- Multiple data collection platforms: Windows, Web, iOS (iPad), Android (future)
- Advanced reconciliation, auditing and logging
- Export of collection results in multiple formats: standard XML, program office XML, text, SAS

DCAS Data Transmission for the Program Office
- Aggregation of data collected on tablets in MDES structured database (based on VDR)
- Generation of the Program Office XML files

Quality Control

DCAS Web Viewer
- Web based tool to view collected data
- Displays collected data, instrument metadata, and paradata

DCAS Web Editor (planned)
- Web based tool to edit/annotate collected data
- Displays collected data, instrument metadata, and paradata