



Testing strategies for CAI and CAI related applications

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Today's Presentation

- Four different projects
- For each project
 - Project Overview
 - Testing Responsibilities
 - Key Aspects and Accomplishments
 - Approaches that helped
- Types of testing performed on these projects
 - Functional testing – flow of questionnaire
 - Integration testing
 - Usability testing
 - Section 508 testing
 - Database/Backend testing

Roadmap to Successful Testing

Roadmap to Successful Testing

Write the detailed test steps

Execute test steps to verify functionality

Develop the applicable set of scenarios

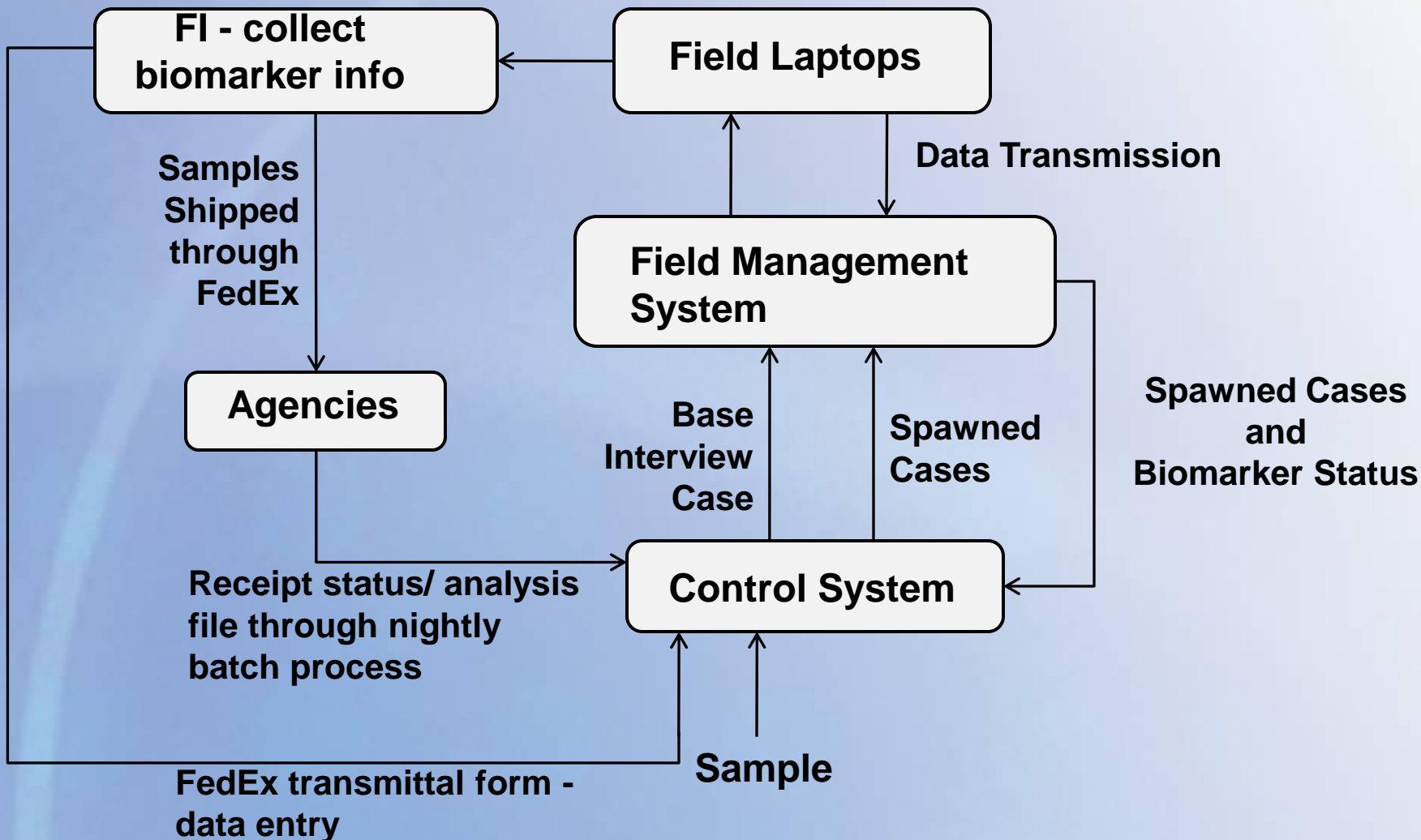
Conceptualize the testing approach

Research and identify the key area that requires intensive testing

Project 1 - Overview

- Data collection to study the impact of work on families and their health
- Three main components
 - Field Interviewer laptops involving 6 Blaise instruments
 - Field Management System
 - Control System
- Nightly batch jobs for integration

Case data flow



Testing Responsibilities

- Tracking FedEx shipments
 - Correlating the biomarker sample with the case after the shipment was sent to agencies

- Testing of the base instrument
 - Spawning of cases
 - Selecting the right coverage of scenarios
 - Different personal demographics of the individual

- Verification of event codes
 - Sequence of flow of the events
 - Event constraints that needed extensive verification

Project 2 - Overview

- Four questionnaires were developed
- First study involved two web surveys
 - Each survey targeted different population across the country
- Sequel study involved two more web surveys
 - Each targeted different groups within the client's office
- Both consisted of questions that involved skip logics at various levels

Testing Responsibilities

- Usability testing of the surveys
 - Participants selected were across the country
 - Involved usage of Skype and phone to accomplish the task

- Verification of skip logics

- Section 508 compliance verification
 - Section 508 verification tools like AccVerify, WAT
 - Screen Reader – JAWS

Project 3 - Overview

- Web based monitoring system for CARI (Computer Audio-Recorded Interview) files
- Quality assurance of audio files
 - Ensure that the data collected in a survey have as little error as possible. Examples of error:
 - Fabrication of data
 - Non-verbatim interview

Testing Responsibilities

- Testing data load
 - Positive tests
 - Negative tests

- Functional testing
 - Conformance to the requirements specified

- Performance and load testing
 - Metrics like Response Time, Requests/sec
 - System was tested to ensure stability under load

Testing data load

- Verification of return values
 - 0 – Success
 - 1 – Fail (no data loaded)
 - 2 – Partial (some data loaded)
- Correct coverage of scenarios
 - A single survey with several questions
 - One survey case with multiple questions
 - One interviewer with multiple recordings per question resulting from “revisiting” the question
- Data load involved three different files
 - survey_in.dat
 - cases_in.dat
 - audio_in.dat

Example test scenario

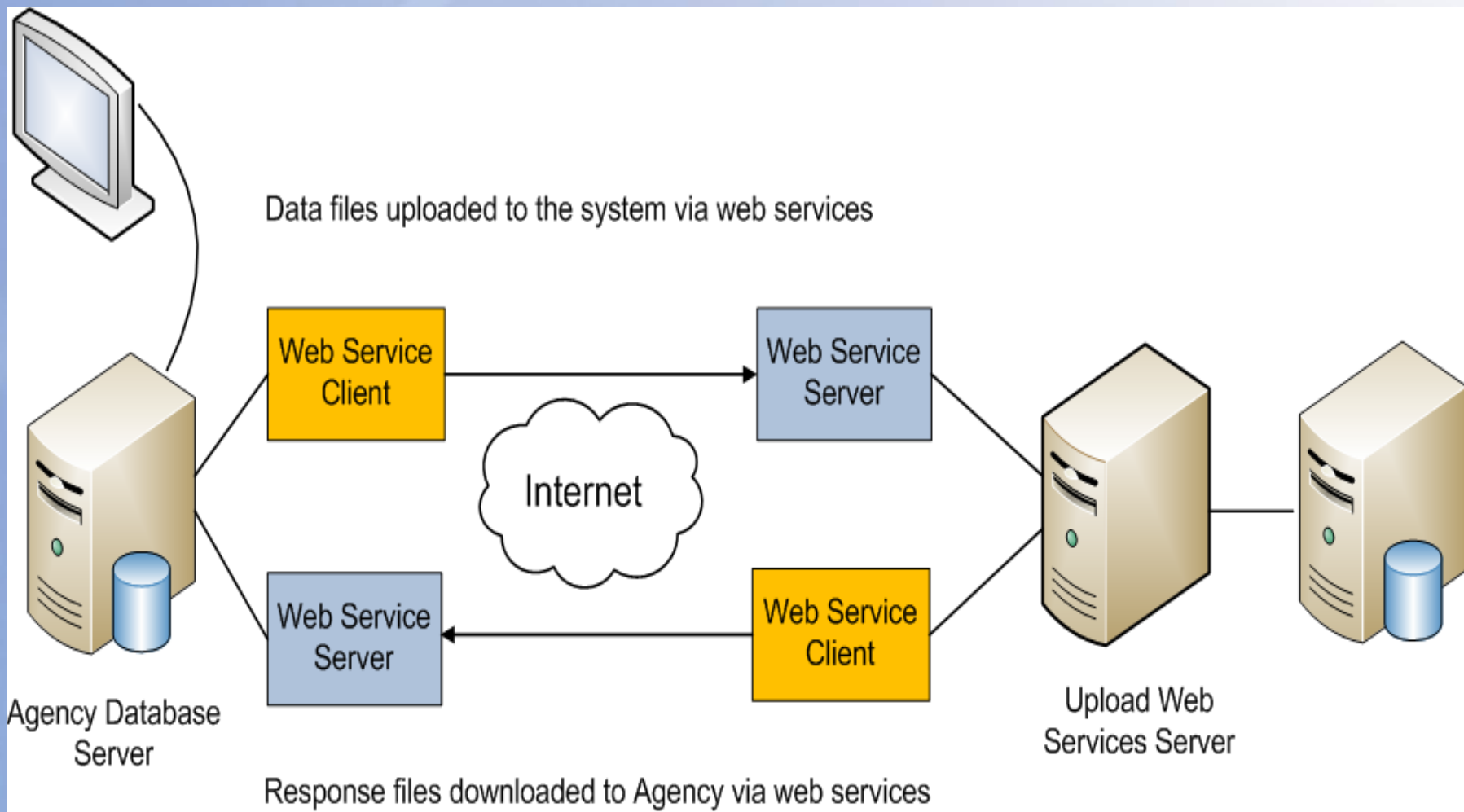
Description of the Test Scenario	Expected Result – Return Value	Actual Result – Return Value	Test Result
<ol style="list-style-type: none">1. Generate valid input files (survey_in, cases_in and audio_in)2. Create a survey online that has a different survey name from the one that exists in the three input files3. Load the data into the database	Due to mismatch of the Survey names, the data load should fail. Return Value = 1	No data was loaded. A value of 1 was generated.	Pass

Project 4 - Overview

Data collection by agencies to set program-specific performance targets, and to measure performance on a regular basis against those targets, and also to report annually.

- Data entry via website
- Data entry using upload process
 - Involved eXtensible Markup Language (XML) files

How web services technology is used



Testing Responsibilities

- Testing data upload
 - Validate XML input file against XML Schema Definition (XSD)
 - Validate XML input files for Business Rules, Data Integrity
 - Verify for invalid file formats
 - Verify 'Response' XML files are generated for every upload.

- Functional testing
 - Conformance to the requirements specified

Example Input and Response file

- Parts of Input file (contains numeric data)
 - `</Services Planned>`
 - `<Gendercode>2</Gendercode>` Gender = Male (2)
(Corresponds to A1 field in the website)
 - ...
 - ...
 - `<Pregnant>1</Pregnant>` Pregnant = Yes (1)
(Corresponds to C5 field in the website)
- Response file (contains error and processing info)

```

<ProcessErrors>
  <Error>
    <Code>ServicesC2shouldBe</Code>
    <Position>22</Position>
    <Message>If A1 is male, then C5 must = -1</Message>
  
```


Summary

- Applications vary – maybe laptop based or web based or database based
- The testing requirements on each application also vary
- Testers need to be flexible and capable
- Certain requirements/scenarios/key areas require intensive testing
 - Challenging / time consuming
 - Select optimal techniques that expedite testing

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