Business Proposal

Prepared For:
Colorado Secretary of State Office

Documented Quote
Assessment of Voting Systems Technology
DQ2-1303-SCORE

Prepared By: IV&V Testing Solutions, LLC
Represented By: Terri Grenda
July 17, 2013
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1.0 Executive Overview
IV&V Testing Solutions specializes in Quality Assurance and Software Testing Verification and Validation but part of our business is assessing systems for key factors such as financial and data integrity and accuracy, network and interfacing systems operability, security, usability and maintainability along with expandability for future growth.

IV&V Testing Solutions has provided technical guidance and risk analysis working with the State Department and Agencies. We work with the agency to not only find potential risks and/or warnings for any potential project failure but work with the staff to make recommendations. IV&V Testing Solutions can help close the gaps in open end terminology and help deliver a better defined final product.

IV&V Testing Solutions has over 20 years’ experience working with multiple transactional complex systems in the private and public sectors within the State of Colorado. IV&V Testing Solutions has work on SCORE I and II. Our personnel were key components the Quality Assurance and Software Testing for IV&V and work closely with the end users for User Acceptance and Election support. We have hands on experience working with the Department of State and Counties for several elections including onsite and help desk support.

IV&V Testing Solutions will provide the correct assessment for the Colorado’s voting systems technology. Working the Colorado Department of State, the Commission and County personnel to create and present a need assessment for the current state of technology including voting systems, certification of voting systems and replacement of voting systems.

2.0 IV&V Testing Solutions Responses to Statement of Work:

A. The current state of technology:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voting Systems</td>
<td>Conduct analysis of voting systems currently used in Colorado.</td>
</tr>
<tr>
<td></td>
<td>Review County system inventory and election management needs.</td>
</tr>
<tr>
<td></td>
<td>Conduct Interviews with CDOS, Commission and Counties.</td>
</tr>
<tr>
<td></td>
<td>Review Lessons Learned from prior elections.</td>
</tr>
<tr>
<td></td>
<td>Identify available voting systems that comply with HB 13-1303 and</td>
</tr>
<tr>
<td></td>
<td>Colorado elections code.</td>
</tr>
<tr>
<td></td>
<td>Assess New Rules, Polices and Procedures according to HB 13-1303.</td>
</tr>
</tbody>
</table>
### Certification of Voting Systems

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review the voting systems certified by the US Election Assistance Commission (EAC) and compare list to what is currently certified in Colorado.</td>
<td></td>
</tr>
<tr>
<td>Determine list of voting systems in Colorado not fit for use now or within the next years.</td>
<td></td>
</tr>
<tr>
<td>Comply a list of voting systems which meets the EAC put not yet certified in Colorado</td>
<td></td>
</tr>
<tr>
<td>Review other state's voting systems with a focal point on all Mail Ballot election management processes.</td>
<td></td>
</tr>
<tr>
<td>Interview California, Oregon and Washington’s election voting systems fit for usage</td>
<td></td>
</tr>
</tbody>
</table>

### Replacement of Voting Systems

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review compatibility requirements for new equipment against the current SCORE system</td>
<td></td>
</tr>
<tr>
<td>Assess new equipment again HAVA and HB 13-1303 requirements</td>
<td></td>
</tr>
<tr>
<td>Review lessons learned on replacing voting systems in other states and determine risks and potential issues.</td>
<td></td>
</tr>
<tr>
<td>Review a uniform voting system need for small county needs but can be used for large county volume</td>
<td></td>
</tr>
</tbody>
</table>

### B. The election-related technological costs and funding sources:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify available voting systems that comply with HB 13-1303 and Colorado elections code.</td>
<td></td>
</tr>
<tr>
<td>Assess New Rules, Polices and Procedures according to HB 13-1303.</td>
<td></td>
</tr>
<tr>
<td>Review budget needs for 7 possible 8 (Elbert) counties who need to replace voting system equipment within the next 0-2 years.</td>
<td></td>
</tr>
<tr>
<td>Evaluate the budget for the 3 counties who have planned funds for to replace voting system equipment within the next 0-2 years.</td>
<td></td>
</tr>
<tr>
<td>Requirement</td>
<td>Action</td>
</tr>
<tr>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>Analysis on funding sources for new equipment costs</td>
<td>Review the possibility of the Secretary of State’s office supporting the cost of implementing a uniform voting and election management system including but not limited to ballot printing, voting equipment, help desk support, etc. Explore the possibility of Federal Grant or Supplemental Request (SBR) from the State of Colorado to fund new equipment or move forward with a uniformed voting system.</td>
</tr>
</tbody>
</table>

**Potential Risks:**
- No available funding to replace voting systems
- Learning curve and training needs to replace voting systems
- New voting equipment is not compatible with current voter registration and election management software
- Available systems are not compliant with HB 13-13 and Colorado election law
- Acceptance by the Citizens and Counties of Colorado for all mail ballot movement
- Acceptance by the Citizens and Counties of Colorado for a uniformed voting system movement
- Certifications on any new Colorado voting equipment cannot be certified in a timely manner.
- Disaster and Recovery plans fail
- Software modifications to the current SCORE system cannot be completed in a timely manner without Scope, Budget or Timeline impacted.
- Projected cost savings are not realized

**Pricing:**
Hourly rate at $125.00 plus materials for final report, not to exceed $24,000. If maximum costs are exceed, then work will be discounted to deliver final report.
Contract Deliverables
Deliverables listed in the table below will be delivered to the CDOS and the Commission

<table>
<thead>
<tr>
<th>Task</th>
<th>Deliverable</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report of Task Order Activities</td>
<td>Provide a summary of completed activities and resources provided to perform the work requested in each task order awarded and is in progress. Each summary requires signoff by the Project Sponsor.</td>
<td>To be submitted to the CDOS Contract Manager by the 1st working day of each month.</td>
</tr>
<tr>
<td>Project Status Reports</td>
<td>Forward a copy of the status reports being provided to the project sponsor for each task order in progress.</td>
<td>To be submitted to the CDOS Contract Manager by the 1st working day of each month.</td>
</tr>
<tr>
<td>Invoices</td>
<td>Prepare and submit invoice based on time and materials to the Project Sponsor and the CDOS Contract Manager.</td>
<td>Monthly</td>
</tr>
<tr>
<td>Inspection of Work</td>
<td>The CDOS Contract Manager will arrange a weekly review with the Project Sponsors and stakeholders to inspect the work provided under the contract in the form of creating a final report to present to State Affairs committees of the House of Representatives and the Senate including supporting material.</td>
<td>Weekly</td>
</tr>
<tr>
<td>Final Report</td>
<td>Final Report Presentation and Materials</td>
<td>Final Deliverable</td>
</tr>
</tbody>
</table>

3.0 Background
IV&V Testing Solutions, LLC, established in 2006, is a women-owned organization dedicated to providing software testing services and quality assurance to our customers, clients and community. We are dedicated Quality Assurance Team providing Independent Verification and Validation Services following the IEEE 1012 Standards and/or Quality Assurance Software Testing following the IEEE 829 & 730 standards. We incorporate Industry Standards with Project Management Institutes PMBOK and industry best practices to provide expert advice in key critical areas to your project while providing the level of validation to verify your development effort/IT system.

IV&V Testing Solutions’ staff is highly qualified and certified people. Each team member has at least 10 years of hands-on field experience and active members in the Quality Assurance and
Software Testing community. We promote being the best through team effort, education, experience and honesty.

IV&V Testing Solutions focus is ensuring quality in our community. Our focus is to provide senior level industry experience to small businesses and local government community who may not have the opportunity to provide these resources.

4.0 IV&V Testing Solutions Information

IV&V Testing Solutions, LLC  
P.O. Box 16730  
Golden CO 80402  
720-988-8476

FEIN - 87-0760089

Key Personnel  
Terri Grenda, President  
Christine Granato, Senior Consultant

5.0 IV&V Testing Solutions IV&V and Quality Management Experience

IV&V Testing Solutions partnered with WDS has provided IV&V and Quality Management services on several projects for the State of Colorado. Here is a listing of projects for IV&V and Quality Management services:

Department of Labor & Employment – Internet Self-Service (ISS)  
- Partner with Wyant Data System  
- Perform Quality Manager and Testing function

Department of Judicial Services – JPOD/ICCES  
- Partner with Wyant Data System  
- Perform Independent Assessment for Quality Assurance and Testing Review

Department of Human Services - AWARE  
- Partner with Wyant Data System  
- Perform IV&V for Quality Assurance and Testing Review

Department of State – Campaign Finance  
- Partner with Wyant Data System  
- Perform IV&V for Quality Assurance and Testing Review

Department of State – SCORE II  
- Partner with Wyant Data System and ProtoTest  
- Perform IV&V for Quality Assurance and Testing Review
6.0 IV&V Testing Solutions Testing Experience

Department of Labor & Employment – Internet Self-Service (ISS)
- Partner with Wyant Data System
- Perform Quality Manager and Testing function
- Asp.Net Front End and SQL 2008/Mainframe Back End
- Budget over $7,000,000
- Deliverables include:
  - Review Team’s Deliverables for project (RFP, Project Plan, Environment, Requirements, etc.)
  - Review Development Team Deliverables (Design, Code, Testing, Plans, Support, etc.)
  - Create Formal Inspection Report on Development Deliverables
  - Participate in In-Formal Inspections
  - Perform Complete Risk Analysis
  - Perform Acceptance Testing on Final Product
  - Oversee User Acceptance Testing
  - Oversee Data ETL Process
  - Oversee Pilot
- Create Automated Business Test Scenarios using VSTS 2010 for Performance Testing

Department of Judicial Services – JPOD/ICCES
- Partner with Wyant Data System
- Perform Independent Assessment for Quality Assurance and Testing Review
- Budget over $25,000,000
- Java Front End and Oracle/Mainframe Back End – 25 Interfaces
- Deliverables include:
  - Review a snap-shot of time on Team’s Deliverables for project (RFP, Project Plan, Environment, Requirements, etc.)
  - Review a snap-shot of time Development Team Deliverables (Design, Code, Testing, Plans, Support, etc.)
  - Create Formal Inspection Report on Development Deliverables
  - Perform a snap-shot of time Risk Analysis

Department of Human Services - AWARE
- Partner with Wyant Data System
- Perform IV&V for Quality Assurance and Testing Review
- Budget over $5,000,000
- Asp.Net Front End and SQL 2008 Back End – Replaced Mainframe and 3 Interfaces
- Deliverables
  - Review Team’s Deliverables for project (RFP, Project Plan, Environment, Requirements, etc.)
Proposal for Colorado Secretary of State Office

Assessment of Voting Systems Technology

V 1.0, dated 7/17/2013

Department of State – Campaign Finance

- Partner with Wyant Data System
- Perform IV&V for Quality Assurance and Testing Review
- Budget over $2,000,000
- Java Front End and Oracle Back End
- Deliverables
  - Review Team’s Deliverables for project (RFP, Project Plan, Environment, Requirements, etc.)
  - Review Development Team Deliverables (Design, Code, Testing, Plans, Support, etc.)
  - Create Formal Inspection Report on Development Deliverables
  - Participate in In-Formal Inspections
  - Perform Complete Risk Analysis
  - Perform Audit on Vendor’s System Test Process
  - Requirements Traceability Matrix
  - Review Requirements for Testability
  - Review System and User Acceptance Test Plan
  - Review Business User Acceptance Test Scenarios
  - Tracked Bugs (Aging Report)
  - Perform Acceptance Testing on Final Product
  - Oversee User Acceptance Testing

Department of Education – FSSDS

- Partner with Wyant Data System
- Perform Test Manager and Testing function
- Deliverables include:

- Automated Business Test Scenarios using VSTS 2010
- Requirements Traceability Matrix
- Review Requirements for Testability
- Create System and User Acceptance Test Plan
- Plan Test Strategy
- System Test Case and Script writing
- Taught Business to Write User Acceptance Test Scenarios
- Tracked and Managed Bugs
- Collect Status for writing and executing tests
- Participates in 'Go' decisions
- Implementation plan review
- Test summary analysis

Department of Labor & Employment – UI SIDES (5 Participating States)
- Partner with Wyant Data System
- Perform Colorado’s Lean Test Manager and Testing function
- ASP.Net/XML files Front End and Mainframe Back End
- Deliverables include:
  - Requirements Traceability Matrix
  - Review Requirements for Testability
  - Create System and User Acceptance Test Plan
  - Plan Test Strategy
  - System Test Case and Script writing
  - Taught Business to Write User Acceptance Test Scenarios
  - Tracked and Managed Bugs
  - Collect Status for writing and executing tests
  - Participates in 'Go' decisions
  - Implementation plan review
  - Test summary analysis

Department of State – SCORE II
- Partner with Wyant Data System
- Perform IV&V for Quality Assurance and Testing Review
- Budget over $5,000,000
- Java Front End and Oracle Back End – 5 Interfaces
- Deliverables
  - Review Team’s Deliverables for project (RFP, Project Plan, Environment, Requirements, etc.)
  - Review Development Team Deliverables (Design, Code, Testing, Plans, Support, etc.)
  - Create Formal Inspection Report on Development Deliverables
  - Participate in In-Formal Inspections
  - Perform Complete Risk Analysis
  - Requirements Traceability Matrix
  - Review Requirements for Testability
  - Create System and User Acceptance Test Plan
  - Plan Test Strategy
  - System Test Case and Script writing
  - Taught Business to Write User Acceptance Test Scenarios
  - Tracked and Managed Bugs
Collect Status for writing and executing tests
Perform Acceptance Testing on Final Product
Oversee User Acceptance Testing
Oversee Pilot

Department of Labor & Employment - Auto Coder
- Partner with Wyant Data System
- Perform Test Manager and Testing function
- ASP.Net Front End/ SQL 2000/Mainframe Back End
- Deliverables include:
  - Requirements Traceability Matrix
  - Review Requirements for Testability
  - Create System and User Acceptance Test Plan
  - Plan Test Strategy
  - System Test Case and Script writing
  - Reviewed Business User Acceptance Test Scenarios
  - Tracked and Managed Bugs
  - Collect Status for writing and executing tests
  - Participates in ‘Go’ decisions
  - Implementation plan review
  - Test summary analysis
- Automated Business Test Scenarios using VSTS 2005

Bank of America/Nexstar
- Data Conversion Specialist
- Oracle Back End
- Deliverables:
- Define requirements
  - Map new tables, views, fields, reports and extracts
  - Define batch file processes for Nexstar Data
  - Test batch file process
  - Validate translation and new Central Repository
  - Validate any Nexstar platforms interfacing with Central Repository
  - Review batch file process (adverse affects)
  - Review any Central Repository data interfacing Nexstar platforms
  - Collaborate with team members to ensure quality
  - Perform Risk Analysis
  - Perform Gap Analysis
  - Project Updates
  - Contingency Planning
  - Clean up

Although IV&V Testing Solutions does not have any experience in the private sector for IV&V, our staff has over 20 years experience in the private sector performing Quality Assurance and Software Testing.
### 7.0 IV&V Testing Solutions References

<table>
<thead>
<tr>
<th>Project/Client Organization</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>State of Colorado</td>
<td>Chuck Busch</td>
</tr>
<tr>
<td>Department of Vocational Rehabilitation</td>
<td>(303) 866-7312</td>
</tr>
<tr>
<td>CO-AWARE Process Review</td>
<td><a href="mailto:Chuck.Busch@state.co.us">Chuck.Busch@state.co.us</a></td>
</tr>
<tr>
<td>5055 S. Lowell Blvd</td>
<td></td>
</tr>
<tr>
<td>Denver, CO 80236</td>
<td></td>
</tr>
<tr>
<td>Wyant Data Systems</td>
<td>Scott Lee/ Rick Wyant</td>
</tr>
<tr>
<td>245 Century Circle</td>
<td>303-665-4452</td>
</tr>
<tr>
<td>Suite 106</td>
<td><a href="mailto:lees@wyantdata.com">lees@wyantdata.com</a></td>
</tr>
<tr>
<td>Louisville, CO 80027</td>
<td><a href="mailto:wyantrd@wyantdata.com">wyantrd@wyantdata.com</a></td>
</tr>
<tr>
<td>ISS Project</td>
<td>Janey Antal</td>
</tr>
<tr>
<td>State of Colorado</td>
<td>303-318-9322</td>
</tr>
<tr>
<td>Department of Labor and Employment</td>
<td><a href="mailto:Janey.Antal@state.co.us">Janey.Antal@state.co.us</a></td>
</tr>
<tr>
<td>251 E. 12th Avenue</td>
<td></td>
</tr>
<tr>
<td>Denver, CO</td>
<td></td>
</tr>
</tbody>
</table>

### 8.0 IV&V Testing Solutions Resumes
Terri Grenda
IV&V Testing Solutions

Summary:
Terri Grenda – Ms. Grenda is a Certified Software Test Engineer through the QAI Goble Institute and has acquired a professional level of competence in the principles and practices of quality control in the IT profession. The QAI Common Body of Knowledge is based on the Industry Models (CMMI, SEI, ISO 9000-9001, and Malcolm Bald ridge). Although Terri has chosen to specialize in the Quality Assurance area, she also has experience with the entire PMBOK software lifecycle. Ms. Grenda has worked on several multi-million projects within the state and has excelled at working with all levels of management. Ms. Grenda is the president of IV&V Testing Solutions (IVVTS) and has 18 years experience in information technology industry.

Professional Experience:
IV&V Testing Solutions, LLC 02/09 - Present
Quality Assurance Manager
Department of Labor & Employment – ISS Project

IV&V Testing Solutions, LLC 01/13 - Present
Quality Assurance Tester
Department of Human Services – PSSP Project
Quality Assurance Tester for Wyant Data Systems. Perform Quality Assurance function on WDS Development team for the CHATS PSSP project sponsored by CDHS. Responsible for: test effort estimation (project planning), documentation review, design work sessions, final project walkthroughs, functional and technical design, and test plans. Performs risk analysis and writes test cases. Develops execution schedules. Gathers test data. Collects daily stats for test case progress and defect management and reports analysis to upper management. Participates in ‘Go’ decisions, implementation plan reviews, and test summary analysis.

IV&V Testing Solutions, LLC 02/12- 07/12
Quality Assurance Manager
Department of Judicial – JPOD/ ICCES Project
Quality Assurance Manager with Wyant Data Systems. Performed Independent Assessment for Quality Assurance and Testing Review that was presented to the State Committee. Review a snap-shot of time on Team's Deliverables for project (Project Plan, Environment, Requirements, etc.) Review a snap-shot of Development Team Deliverables (Design, Code, Testing, Plans,

IV&V Testing Solutions, LLC 12/09 – 09/11
**IV&V Quality Assurance Specialist**
**Department of Human Services - AWARE**


IV&V Testing Solutions, LLC 02/09 – 11/09
**IV&V Quality Assurance Specialist**
**Department of State – Campaign Finance**


IV&V Testing Solutions, LLC 11/06 – 12/08
**IV&V Quality Assurance Specialist**
**Department of State – SCORE II**


IV&V Testing Solutions, LLC 10/07 – 10/08
**Quality Assurance Tester**
Department of Labor & Employment - Auto Coder

Quality Assurance Tester for Wyant Data Systems. Perform Quality Assurance function on WDS Development team for the AutoCoder project sponsored by CDLE. Responsible for: test effort estimation (project planning), documentation review, design work sessions, final project walkthroughs, functional and technical design, and test plans. Performs risk analysis and writes test cases. Develops execution schedules. Gathers test data. Collects daily stats for test case progress and defect management and reports analysis to upper management. Participates in 'Go' decisions, implementation plan reviews, and test summary analysis.

IV&V Testing Solutions, LLC

Senior Consultant

Data Conversion Specialist for the Bank of America/Nexstar merger. Further define requirements, Map new tables, views, fields, reports and extracts, Define batch file processes for Nexstar Data, Test batch file process, Validate translation and new Central Repository, Validate any Nexstar platforms interfacing with Central Repository, Review batch file process (adverse affects), Review any Central Repository data interfacing Nexstar platforms, Collaborate with team members to ensure quality, Perform Risk Analysis, Perform Gap Analysis, Project Updates, Contingency Planning / Clean up, Unforeseen activities

ProtoTest, LLC

Senior Consultant

IV&V Quality Assurance Specialist

Lead Tester for a new data central repository. Created Test Plan, Test Cases, Test Scripts and Testing Stats for the testing effort on Data Definition Language (DDL) for Oracle schema objects (e.g., tables, indexes, stored procedures, triggers, sequences, etc), Dependent Objects, Database Structures, Specific Data Validations and Database Role Definition. Automating the regression testing using ODBC connectivity and excel spreadsheets.

IV&V Testing Solutions, LLC

Senior Consultant

Quality Assurance Specialist for the independent verification and validation team on the Statewide Colorado Registration and Election (SCORE) system. Responsibilities include verification and validation, using the IEEE standards as a guideline, of all the elements within the project life cycle with a focus on testing the product to ensure that it fulfills all of the defined requirements and performs as expected. Formal inspections are conducted on each deliverable resulting in a formal findings report. Other responsibilities include risk mitigation, system and user acceptance test planning, system test case creation and execution and assistance with user acceptance testing.

Nelnet, Inc

Lead QA Engineer

Responsible for testing new projects and enhancements to existing systems. Supported five Websites and three AS400 systems. Manages several projects across multiple regions. Serves as either the primary tester or Lead tester depending on the project size. Works collaboratively with team members on testing methodologies and company products. Serves as the Subject Matter Expert for all Web products. Responsible for: test effort estimation (project planning), documentation review, design work sessions, final project walkthroughs, functional and technical design, and test plans. Performs risk analysis and writes test cases. Develops execution schedules. Gathers test data. Collects daily stats for test case progress and defect
management and reports analysis to upper management. Participates in ‘Go’ decisions, implementation plan reviews, and test summary analysis.

IBM - Manpower Professional

Senior Software Tester

02/01-03/03

Responsible for all testing analysis, test strategy, test case writing and prioritization for an internal IBM project. The project’s focus was to streamline the entire IBM ordering and service system which included Finance and Control, Sales and Distribution, Business Planning and Solutions, Asset Management, Manufacturing Materials and Supplies, Inventory, etc. The architecture was a web-based program which interfaced with 27 different database systems including SAP.

Testing Skills:


Tools:

Windows, Mac, Internet Web Browsers (Internet Explorer, Netscape, Mozilla, Firefox, Opera), Web portals, Client-side controls (Java applets, JVM and Active X controls), Dynamic data, Java, JAR, Java Applets, JSP, ASP.Net, HTML, Java Script, C++, C#, VB scripting, PHP, Perl, HTML, XML, SQL/PL SQL, SOAP, Tom Cat, UNIX, Linux, J2EE, Servers (Apache, Email, Web Service, and Windows) SSI, XSSI, Apache JSSI, Dynamic Web pages, CGI protocol and EDI sessions

Databases:

Oracle, DB2, Lotus Notes, MS Access, AS400, SQL Server 2010

Related Tools:

TOAD, Erwin, Rational Rose, Raven, CVS, STAR team, VI Editor, Clear Case, Visual Source Save, Boxer Text Editor and other proprietor tools

Testing and Defect Tracking Tools:

Visual Studio Test Suite 2010, MS SharePoint, Win Runner, Web Load, e-Test, eValid, Test Manager, Proprietor tools, Test Works, Bugzilla, Clear Quest, Aardvark, PR Tracker, IssueTech and Salesforce

Education:

Bachelor’s Degree in CIS Programming/Internet Development - DeVry Institute

Certifications:

Certified Software Test Engineer - QAI (Quality Assurance Institute)

Affiliations:

Rocky Mountain Internet User Group, Colorado Software & Internet Association, Internet Chamber of Commerce, Software Quality Assurance in Denver

White Papers:

Early Test Involvement, Test Automation in the Agile World, Test Approach for Central Data Repository.
Christi Granato  
IV&V Testing Solutions

SUMMARY
Information Technology quality assurance and testing professional with 12 years of information technology (IT) experience focusing on business analysis, process improvement, and software testing. During the last several years, she has been responsible for decomposing applications to determine the functional areas that require testing and turning that into test procedures, cases and scripts for test execution. She has successfully worked with various software development processes including agile methodology.

EXPERIENCE
Senior Consultant - IV&V Testing Solutions, LLC 12/2007 – Present

Test Manager Department of Education– FSSDS
Test Manger for Colorado Department of Education on the FSSDS project. Responsible for all testing analysis, test strategy, test case writing and execution, and assistance with user acceptance testing. Collect daily stats for test case progress and defect management and reports analysis to project management and project team.

Test Manager – UI SIDES
Colorado’s Test Manager for Colorado Department of Labor and Employment on the UI SIDES project. Responsible for all Colorado’s testing analysis, test strategy, test case writing and execution, and assistance with user acceptance testing. Collect daily stats for test case progress and defect management and project team. The UI Sides project is inclusive of 5 States and several third party brokers using inbound/outbound XML files.

Test Specialist – SCORE II
Test specialist for the independent verification and validation team on the Statewide Colorado Registration and Election (SCORE) system. Responsibilities include verification and validation, using the IEEE standards as a guideline, of all the elements within the project life cycle with a focus on testing the product to ensure that it fulfills all of the defined requirements and performs as expected. Other responsibilities include risk mitigation, system and user acceptance test planning, system test case creation and execution, and assistance with user acceptance testing.

Senior Consultant – IV&V Testing Solutions
Senior Consultant, specialties include all the elements within the project life cycle with a focus on testing the product to ensure that it fulfills all of the defined requirements and performs as expected. Formal inspections conducted on each deliverable resulting in a formal findings report. Other responsibilities include risk mitigation, system and user acceptance test planning, system test case creation and execution, and assistance with user acceptance testing.

Senior Consultant - Fujitsu Consulting 09/06 – 12/07

Business Analyst - Visa
Business Analyst in the Prepaid Card Division, gathered requirements for an iterative development environment, managed and coordinated code releases between other departments and production corrections. Assessed and mitigated risk; guided projects to successful completion through full lifecycle (requirements gathering to post-delivery support).

**Lead Software Tester - Fiserv**
Lead Software Tester and Manager of User Acceptance Testing at Fiserv Lending Solutions. Analyze requests from the business to determine if all requirements have been outlined for each functional group. Responsible for reverse engineering a complex multiple platform application in order to create test procedures, cases and scripts for component, integration, system and user acceptance testing. Work with user group to determine software improvements that will streamline business processes.

Senior Consultant – ProtoTest, Centennial, CO 10/04 – 09/06

**Test Staff Manager - ProtoTest**
Managed 30-40 consultants who were assigned different projects. Reviewed weekly status reports. Participated in annual review process and advice consultants on Software Quality Assurance Processes. Responsible for developing benchmark checklists and templates for the quality assurance assessment process. Developed the ProtoTest Software Quality Assurance Process (PSQP). Revised the Fundamental of Software Testing (FOST) student workbook to be compliant with ISTQB standards. Co-trainer for the three day FOST course. Participated in the creation of RFI documentation for several major clients. Awarded 2005 Employee of the Year.

**Test Special – SCORE I**
Test specialist for the independent verification and validation team on the Statewide Colorado Registration and Election (SCORE) system. Responsibilities include verification and validation, using the IEEE standards as a guideline, of all the elements within the project life cycle with a focus on testing the product to ensure that it fulfills all of the defined requirements and performs as expected. Formal inspections conducted on each deliverable resulting in a formal findings report. Other responsibilities include risk mitigation, system and user acceptance test planning, system test case creation and execution, and assistance with user acceptance testing.

**Test Engineer - NetQuote**
Test engineer for NetQuote, a Microsoft development organization, responsible for test case creation and execution on various web browsers for web applications to include: customer intranet; account manager internet; and insurance agent extranet.

Presenter at the 2006 SQuAD conference in Denver, CO. Successfully completed the prescribed requirements in software testing of the International Software Testing Qualifications Board and was awarded the designation of Certified Tester, Foundation Level (CTFL).

**Inflow, Inc., Denver, CO 09/00 – 09/04**

**Manager of Software Engineering Services**
Encompassed management of software quality engineering, technical writing, training and software support (help desk). Led a 5-person team through several concurrent projects; responsible for managing schedules and work assignments. Personally performed quality engineering, technical writing, training, and help desk tasks in addition to managing team members. Managed and coordinated projects through creation and execution of project plans.
Assessed and mitigated risk; guided projects to successful completion through full lifecycle (requirements gathering to post-delivery support).

**Lead Software Test**

Software test engineer solely responsible for all validation for a suite of Internet-based software solutions. Leveraged the Extreme Programming Methodology to develop highly successful software test strategies. Demonstrated system engineering skills by reverse engineering and documenting the design of a web application prototype. Developed detailed test cases, wrote procedures, executed tests, identified and analyzed problems.

**Technical Writer/Release Coordinator/Software Test**

Created technical release documentation for the suite of Internet-based software solutions. Responsible for coordinating release of software across multiple functional groups. Leveraged technical writing, communication, and technical training skills to insure successful, on-time software releases. Utilized Internet technologies such as Livelink to streamline the coordination process.

Key member of test team responsible for validation of an Internet based application. Used team working skills and software test knowledge to validate software through several full release cycles. Regularly interacted with software developers and management team members.

Elite Systems, Inc., Englewood, CO

**Software Test Engineer**

Validated Internet based business-to-business procurement application. Responsible for verification of requirements document, verification of feature specification document, and validation of functional capabilities. Engineered test strategies and test cases, wrote procedures, executed tests, and identified and analyzed problems.

Rigorously validated large report system developed for a multinational consumer packaged goods manufacturer. Responsible for verification of design specifications and validation of data marts, database schemas, and end-user reports. Engineered test cases, created procedures, executed test procedures, identified and analyzed problems, and documented test results. Used PVCS Tracker and Version Manager to track problem reports and document versions.

Validated large-scale, distributed enterprise resource planning (ERP) system integrating sales, manufacturing, and inventory for a major manufacturing company. The system integrates globally distributed manufacturing and sales operations into a working whole. Responsible for validation of user interface, functional capabilities, and modeling algorithms. Responsible for maintenance of verification report matrix. Determined test cases, created procedures, executed test procedures, identified and analyzed problems, and documented test results.

**AREAS OF EXPERTISE**

- Quality Assurance Planning
- Risk Analysis
- Defect Management
- System Testing
- Integration Testing
- Operability Testing
- End-to-end Testing
- Automated Testing
- SQL Injection Testing
- Black-box Testing
- Ad-Hoc Testing
- Test Planning
- Test Case Development
- Test Design
- Test Scripts
Platforms: PC, Sun, HP
Operating Systems: DOS, Windows (3.x, 95/98, NT, 2000, XP), MacOS, Unix
Test/QA Tools: PVCS Tracker, PVCS Version Manager, OnTime, JIRA, TeamTrack
Database: Oracle, MS SQL Server, Access
Languages: Tested applications developed in C#, Java, C# .NET, ASP.NET, VB
Other: MS Office (Word, Excel, PowerPoint, Outlook, Visio), MS Project, Crystal Reports, SQL, MS SQL Server Enterprise Manager, Onyx, Livelink, Aperture
Methodologies: Object-Oriented Analysis Design (Models: Waterfall, Incremental and Spiral) and Agile

EDUCATION
Bachelor of Science, Behavioral Science with Minor in Reading from Metropolitan State College of Denver 1993 (Summa Cum Laude)

CERTIFICATIONS
(ISTQB) International Software Testing Qualifications Board - CTFL Certified Tester
K-6 Colorado Teaching Certificate