SABER

Technology Serving Citizens™

PROPOSAL FOR WYOMING'S VOTER REGISTRATION PROJECT

SUBMITTED TO:
State of Wyoming

SUBMITTED BY:
Saber Corporation
1800 SW First Avenue, Suite 350
Portland, Oregon 97201

March 15, 2007

TABLE OF CONTENTS

Glossary of Acronyms ____ 1

1. Executive Summary ____ 3

1.1 Saber – Partner of Choice 3
1.2 Understanding of WyoReg Requirements 4
1.3 About Saber 4
1.4 Our Implementation Approach 5
1.5 Summary 5

2. Company Overview ____ 9

3. Saber Qualifications and Experience ____ 13

3.1 Maryland Centralized Voter Registration System (MDVOTERS) 13
3.2 Oregon Centralized Voter Registration System (OCVR) 18
3.3 Missouri Centralized Voter Registration System (MCVR) 20
3.4 Mississippi Statewide Election Management System (SEMS) 21
3.5 New Jersey Statewide Voter Registration System (SVRS) 24
3.6 Additional Elections References 25

4. Project Management Methodology and Approach ____ 29

4.1 Saber Tracks Approach 29
4.2 Project Activities 34
4.3 Our Project Approach 35

5. Project Schedule ____ 53

5.1 Solution Considerations 53
5.2 WyoReg Deliverables and Milestones 54

6. Project Organization and Key Personnel ____ 64

6.1 Saber's Team and Our Responsibilities 66
6.2 Responsibilities of the State of Wyoming and its Counties 69

7. Technical Solution ____ 72

7.1 System Architecture 72
7.2 Security 77
7.3 Hardware and Software 78
7.4 Network Connections 79
7.5 Antivirus, Firewall, Intrusion Detection 79
7.6 Data Hosting 79

7.7 Backup and Recovery....87

8. The Application ____ 90

8.1 Proposed WyoReg Key Features....90
8.2 WyoReg Baseline Modules and Functional Requirements....93

9. Training ____ 135

9.1 Methodology 135
9.2 Critical Success Factors 136
9.3 Continuous Training.... 137
9.4 Areas of Training.... 137

10. Warranty and Long Term Support Options____ 139

10.1 Application Support 139
10.2 Helpdesk 140
10.3 Infrastructure and Security Monitoring.... 144

11. Pricing ____ 145

Appendix A – List of Functional Requirements in the Baseline WyoReg Application ____ 1

Appendix B – Project Team Resumes ____ 1

GLOSSARY OF ACRONYMS

COTS	Commercial Off The Shelf
DBA	Database Administrator
DL	Drivers License
DSDM	Dynamic Systems Development Methodology
DMV	Division (or Department) of Motor Vehicles
DMZ	De-Militarized Zone
DoS	Denial of Service
ePMO	Enterprise Project Management Office
ERD	Entity Relationship Diagram
ETL	Extraction, Transformation and Load of data
FRS	Functional Requirements Specification
GAD	Gap Analysis Document
GOCO	Government-Owned Contractor-Operated
FHD	Functional Hierarchy Diagram
FRS	Functional Requirements Specifications
HAVA	Help America Vote Act
ICA	Independent Computing Architecture
IPS	Intrusion Protection System
JAD	Joint Application Design
LDM	Logical Data Model
MAA	Maximum Availability Architecture
MOTS	Modified Off The Shelf
MTBF	Mean Time Between Failures
MTTR	Mean Time To Repair
NCOA	National Change of Address
PIER	Post-Implementation Evaluation Report
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
QA	Quality Assurance
QTP	Quick Test Pro
RAD	Rapid Application Development

RMAN	Recovery Manager
RTM	Requirements Traceability Matrix
SBE	State Board of Elections
SDLC	System Development Life Cycle
SLA	Service Level Agreement
SME	Subject Matter Expert
SNMP	Simple Network Management Protocol
SPIRIT	Saber Project Issue and Requirement Information Tracking
SSA	Social Security Administration
SSN	Social Security Number
UAT	User Acceptance Testing
UI	User Interface
UPS	Uninterruptible Power Supply
VPN	Virtual Private Network
VRS	Voter Registration System
WBS	Work Breakdown Structure
WSUS	Windows Server Update Service

1. EXECUTIVE SUMMARY

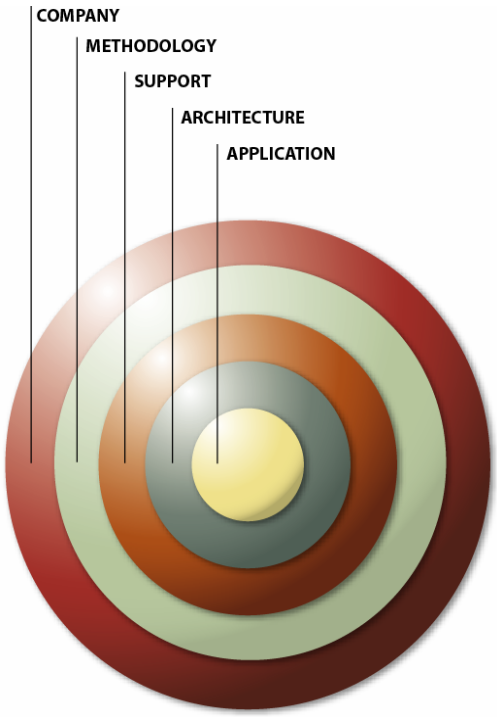
Saber Software, Inc. is excited by the opportunity to collaborate with the State of Wyoming on WyoReg, a fully HAVA compliant Voter Registration and Election Management System. Saber welcomes this opportunity to respond to this competitive negotiation process.

1.1 Saber – Partner of Choice

Saber is a solutions-oriented firm focused on achieving customer-defined success. We believe that your success in delivering superior service to your customers is the best way to measure our success in serving you. Our approach is to work from start to finish creating a single team with our customers - a single team with a single goal. By doing this we can together achieve success, as measured by our clients perceptions, not ours. Our corporate philosophy is predicated on the belief that a cohesive, mutually focused partnership is the key to any engagement—both with the client and with key client stakeholders.

Saber's experience has shown that most state agencies typically follow a procurement process based on diagram seen on the right. Up until the day the contract is signed, the procurement focuses on the inner circle that represents the software being procured. The next highest level of concern by the state agency is the architecture of the software, and how it is integrated. This is followed by the contractor's support program and then the contractor's implementation methodology. The lowest level of concern is typically the contractor itself, provided that it has positive references.

On the day after the contract is signed, the agency often discovers that the order of importance reverses because now, as the agency engages with the company with which it has contracted, its commitment, expertise, methodology, support and solution architecture become the critical success factors. State IT projects that are based on COTS software products rarely fail because of the software. They usually fail because of some combination of flawed implementation, lack of executive sponsorship and lack of buy-in by the users.



It is our goal to work with only those states that are the most knowledgeable and informed about the risks and benefits of implementing such a system. These states recognize that it is not only the features and functions of the application that are important, but also that the architecture be appropriate, the security be airtight, the company be ethical, and the support be world class. Based on this view, we have developed the "onion" across which we have developed our solution, not just the software application (shown on the right).

1.2 Understanding of WyoReg Requirements

It is our commitment to implement a fully HAVA compliant statewide voter registration and election management system by December 15, 2007. We intend to provide the following software and services, leveraging our Electus software as a base solution:

- Project initiation and management services.
- County compliance and successful migration to the Statewide WyoReg System.
- Establishment of system environments, including development, training/conversion, test, and production environments.
- System hardware and software specifications.
- System design and development, statewide Voter Registration Database from our Electus product, and the business and technical requirements from the state and counties.
- Development of rules and regulations for the implementation of the permanent statewide system.
- System and network testing, including unit, integration, system, interface, performance/stress, and reliability testing.
- Acceptance testing, including testing of all activities to take place during the actual deployment, as well as a successful mock elections during User Acceptance Testing prior to the go-live pilot and production.
- Data conversion, encompassing the initial transfer of voter registration data to the VRS from county systems.
- Training and knowledge transfer.
- System deployment in a multi-phased approach.
- Saber will provide WyoReg Application help desk support to the WY counties. Regular hours of helpdesk support will be 8 AM – 5 PM Mountain Time. At least 2 helpdesk staff will be dedicated to the WyoReg helpdesk. Saber also provides extended election support during which 20 hours of manned helpdesk support will be provided.
- System acceptance.
- System support, maintenance, and warranty.

1.3 About Saber

Saber has the technical and functional expertise, the key personnel qualifications, the experience in statewide voter registration implementations, and the integrity to partner with the State to implement a statewide system that complies with all applicable federal and Wyoming laws and meets the needs of state and county users, all within the designated timeline.

Saber has been providing technology solutions and consulting services to forty-seven states and numerous local governments for over twenty-five years. We combine our public sector experience and business acumen with a proven approach to rapidly and inexpensively deploy state-of-the-art solutions that resolve core business issues. Saber's mission statement clearly describes our single-minded purpose in serving government clients: "Saber will be the premier provider of software products and services that enable government to better serve citizens." We have organized to provide software products and services to our government clients along the following lines of business:

- Elections
- Public Retirement

- Motor Vehicles
- Health & Human Services
- Unemployment Insurance
- Technology Services (Systems Integration, Business Intelligence, Document Management)

Saber is the recognized leader in developing, customizing, and implementing statewide VRS, having done so successfully now for ten states. As our proposal will show, Wyoming will benefit from our wide and varied experience in providing software and services to the Election industry.

1.4 Our Implementation Approach

- **Proposed Solution/Approach:** Saber has successfully implemented HAVA projects in ten states. Among the lessons we have learned from these successful implementations is the use of functional or track-based alignment of the project activities. Rather than approach the project as a series of sequential tasks, the track approach means that the project moves forward on five simultaneous tracks, permitting an acceleration of the project schedule, and allowing easier management and oversight of the project for the state. Without this radical transformation of the traditional project schedule, we would not have been able to start the projects for the states of Montana and Maryland in April 2005 with HAVA compliant implementation by January 1, 2006.
- **A Local and Trusted Implementation and Support Team:** Saber will support this project using a team of dedicated professionals in line with Saber's proven tracks methodology as detailed later in this document. Saber will provide a team that is truly the best in its experience, knowledge, and prior success in implementing VRS. Additionally, Saber provides a live twenty hours per day dedicated HAVA help desk in extended elections support, staffed with over ten Tier 1 help desk personnel, four functional analysts, over twenty programmers, and more than ten infrastructure experts. The sole objective of these help desk personnel is to support the end users of our voter registration implementations.
- **A Fault-Tolerant, Scalable, and Secure Architecture:** Saber's proposed architecture is highly available with every hardware component being redundant, so that it can handle more than 300 concurrent users. Saber has proposed a security solution considered an industry best practice from every standpoint. Unauthorized users are prevented from accessing the system in multiple ways and all communications are encrypted. Additionally, intrusion prevention systems, network and appliance sensors, and ongoing monitoring services are constantly inspecting and preventing attacks on the network and system (as opposed to simply identifying and detecting system attacks).

1.5 Summary

To summarize, the benefits that Saber offers the State include:

- **A highly skilled team.** A team that is highly knowledgeable and skilled. This experience base will significantly increase the speed at which we can modify and implement the application to Wyoming's needs and standards. Saber is an expert in managing large projects and closely follows the Project Management Body of Knowledge from the Project Management Institute (PMI).
- **A company expert in elections systems.** We have an expert level knowledge of HAVA, a wide variety of state election laws including experience in NVRA and NVRA-

exempt states, and election systems and processes. Our subject matter experts have successfully implemented ten VRS projects.

- **Ten Successful Statewide Implementations.** Our credibility comes from our track record of successfully implementing ten statewide VRS across the country, six of which utilize our Electus voter registration and election management solution.
- **Dedicated Elections Practice.** Saber has a dedicated Elections Management practice that brings deep subject matter and technology expertise along with a proven capability to deliver statewide VRS. We have over 150 technical and business resources dedicated to the Elections practice. Our project staff has extensive experience in implementing HAVA solutions and a "hands on" understanding of HAVA legislation. Our staff has a number of former state and county elections officials who have helped in the development of the software to focus on election officials' needs and convenience.
- **An understanding of your issues.** Saber not only understands the issues involved with implementing VRS in general; we have also become the preferred vendor for states that have missed the federal deadline or had other vendors fail in delivering their statewide VRS. Both New York and Colorado, two states in those situations who issued RFPs in 2006, have chosen Saber to help them.
- **Deep technical expertise.** This procurement requires substantial technical abilities (network/hardware, etc.). We are an integrator with deep technical expertise that understands elections; not an elections vendor that simply has the baseline technology knowledge to build one application. Our technology expertise is a key indicator for success.
- **One Stop Shop for System Implementation and Post Implementation Support.** Not only does Saber provide expertise on all software development and implementation functions, it is also self-reliant in two very cricitial areas:
  - **Data Migration.** Saber has a well established team that has successfully migrated over over 400 counties in six states with over 20 million voters. There are no external vendor dependencies and most importantly, we are there to address data issues even after implementation.
  - **Post Implementation Support.** Saber has a comprehensive support program that provides end-to-end service for all issues post implementation. In fact, all previous Electus states are on Saber's long term support program. The support is facilitated by a proven and dedicated Helpdesk for the Elections practice.
- **An adaptable solution.** Saber understands that laws and customs vary and we are committed to adapting the Electus solution to meet your needs. We do not expect you to radically change your business processes to adapt to a "one size fits all" solution. We take the time to learn what you need and then adapt Electus to meet your needs because we know that Wyoming is not Colorado or Montana.
- **Independence from any voting equipment company.** Given the concern in the general population, and particularly in the very vocal activist community regarding potential vendor control of elections, this independence allows states to demonstrate greater transparency of the elections process and demonstrate that one vendor does not control the entire election cycle.
- **Saber's Reputation and White Glove Service.** The fact that Saber has never failed to deliver a project sets us apart from our competitors. How many software and system integration companies can make that statement? Our motto is that the contract is the minimum level of service we will perform, not the maximum. Our customers know that they can absolutely rely on us to meet or exceed their expectations. What we seek to

provide is the best value and the elimination of risk. We are also known for our white glove service.

Finally, we are proud to let our reputation speak for itself with this excerpt from a recent letter from the State of Maryland (a full copy of this letter is available in Section 3).

> "It is noteworthy that Saber delivered the MDVOTERS system statewide within a severe time constraint, beginning in April 2005 and ending in December 2005, beating the January 2006 deadline set in the Help America Vote Act. Saber's multi-track delivery approach — encompassing project management, data migration, infrastructure support, software customization, and executive level commitment to organizational change — proved vital to Maryland's success."
>
> *Mary Cramer Wagner, Director of Voter Registration*
> *John Clark, MDVOTERS Project Manager*
> *Maryland State Board of Elections*

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2. COMPANY OVERVIEW

Saber is a company of dedicated people focused on providing technology to serve citizens better. Headquartered in Portland, Oregon, Saber's 900 employees have been building on a reputation of success in delivering winning IT solutions that enable government to better serve citizens for over twenty-five years. In less than ten years, Saber has built a $100 million business and a national reputation by collaborating with clients so that nearly every client serves as a strong Saber advocate. What began as a single-client company has grown to a nation-wide company working with more than 100 public sector customers across multiple program areas.

Saber is a privately held company with deep customer relationships with state and local government entities nationwide, providing software and services that underpin essential functions such as Health and Human Services, Titling and Registration Services, Elections Management and Voter Registration Services, Pension Administration Services, and Tax and Unemployment Insurance Services. We also implement Business Intelligence and Document Management solutions tailored to meet the unique needs of our government customers.

On June 1, 2006, Saber acquired Covansys Corporation's state and local government practice. Like Saber, Covansys' state and local government practice has been a leader in helping state and local governments meet their organizational needs. The combined company, Saber Software Incorporated, includes state and local clients in more than forty-seven states and a rich history of servicing the public sector for over twenty-five years. Our mission is to be the premier provider of software products and services that enable government to better serve citizens.

Firm Name:	Saber Software, Inc.
Number of Years In Business:	20 years (including the purchase of Covansys Public Sector Practice)
Number of Years Providing Similar Services:	20 years (including the purchase of Covansys Public Sector Practice)
Corporate Address:	1800 S.W. First Avenue, Suite 350 Portland, Oregon 97201
Primary Business:	Management Consulting, Systems Integration, Professional Services, Outsourcing for the State and Local Government Sector
Firm Leadership:	Nitin Khanna – Chairman and Chief Executive Officer Karan Khanna – President and Chief Operating Officer
Branch Offices:	• Des Moines, Iowa • Portland, Oregon • Salem, Oregon • Lake Oswego, Oregon • Sacramento, California • Middletown, Connecticut • Annapolis, Maryland • Raleigh, North Carolina • Alpharetta, Georgia • Columbus, Ohio • Albany, NY

Focusing solely on the public sector allows us to tailor our services, offerings, and capabilities to meet the unique challenges that our government customers face. This government focus is distinctive among systems integrators in the industry. Saber expects to continue to build upon our history of on time, on-budget delivery of advanced software in use by state and local governments today.

Figure 1 illustrates Saber's deep experience in implementing strategic, program-based solutions for the public sector. It illustrates Saber's customer base throughout the United States – more than 100 public sector agencies, across multiple program areas, in over 47 states. This experience, capability, and commitment make Saber a compelling choice.

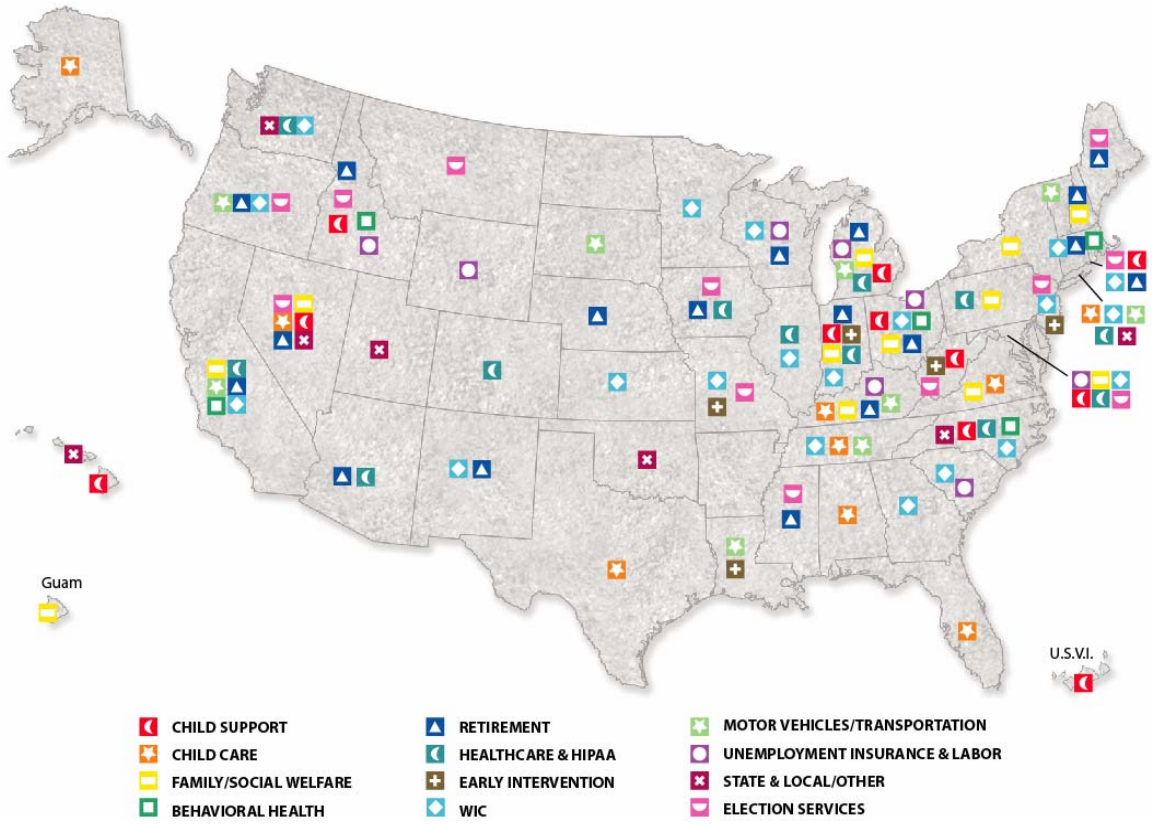

Figure 1. Saber's Customer Base Covers 47 States and Over 100 Agencies.

Saber offers business consulting and systems integration services in several vertical solutions tailored to meet the program needs of specific state and local government agencies and entities. Saber also provides technical services with the more traditional technology solutions tailored to provide customers with operational efficiencies, cost savings, and higher levels of citizen service.

Saber's service offerings fall into two categories.

Program Offerings	Technology Offerings
• Motor Vehicles • Elections • Public Retirement • Human Services • Enterprise Health • Unemployment Insurance	• Custom Application Development • Document Management & Web Portal Solutions • Business Intelligence • Outsourced Application Maintenance

It is our sincere hope that our corporate profile has clearly demonstrated our corporate strength, our single-minded commitment, and our expertise in providing software products and services to state and local governments especially in the Elections community. Saber believes that we have the largest staff of any company in the country dedicated to implementing and supporting statewide VRS, and that after the acquisition of Covansys' State and Local Government business we are the largest company whose sole mission is to provide technology products and services to the government sector. We show our mission here to demonstrate the high degree of alignment between our corporate mission and vision and the type of vendor and partner you are hoping to work with.

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3. SABER QUALIFICATIONS AND EXPERIENCE

Saber is the leader nationally in implementing HAVA compliant centralized VRS and we built our system from the ground to meet the federal HAVA compliance guidelines. References for our Elections and HAVA projects follow below.

Saber has implemented ten statewide Voter Registration Systems (VRS). All of our HAVA projects are currently in production, and were successfully delivered on time and within budget. While there were occasional change orders for various add-on services (such as an additional Campaign Finance module in Mississippi, a Field Support program in Maryland, or an extra year of support in Oregon, etc.) our projects were implemented under the cost totals submitted for each RFP. There is no litigation on any of our projects.

3.1 Maryland Centralized Voter Registration System (MDVOTERS)

Maryland Centralized Voter Registration System Project (MDVOTERS)	
Name and Title	Mary Cramer Wagner
Client Name	Maryland State Board of Elections
Business Address	151 West Street, Suite 200 Annapolis, MD 21401
Phone	(410) 269-2850
Email	mwagner@elections.state.md.us
Dates	April 2005 – Present
Users	300

Background

Under the Help America Vote Act of 2002 (HAVA), the Maryland State Board of Elections (SBE) was required to implement a statewide, centralized voter registration system for the State of Maryland. Through the RFP process, SBE selected Saber Consulting to develop and implement the system.

Goals of the Project

- Establish a secure single, centralized statewide voter registration system that meets or exceeds current county system capabilities and that meets state and federal requirements.
- Enhance the abilities of the counties to verify legitimate voter registrations, identify unqualified voter registrations, change, or purge incorrect or duplicate voter registrations, archive obsolete data, and use valid voter registration information as required by law.
- Enhance Local Boards of Elections (County) and SBE abilities to provide real-time voter registration and election information.
- Meet state and county requirements for a functional, secure, robust, and scaleable voter registration and election management system.

Maryland Centralized Voter Registration System Project (MDVOTERS)

The lifecycle of the Maryland SBE project included two phases:

Phase Processes

I Core System for HAVA Compliance, including
- Initial software customizations
- Performance testing
- User acceptance testing and pilot election
- Training and documentation
- Implementation

II Custom Software Development and Enhancements, including:
- Petitions, election management, absentee and provisional voting enhancements
- Field support for election readiness
- Interfaces
- Reporting, testing training and implementation

Services provided for the Maryland CVR project include project management; system analysis, design, development, and integration; database design and data migration; quality assurance; infrastructure and security implementation; system implementation and deployment (including training, testing and change management).

The MDVOTERS Project began in mid-April 2005 after Maryland awarded Saber a 5-year $14+ million contract under a competitive procurement. The Saber team quickly ramped up with seasoned team members bringing specific subject matter expertise to our proven multi-track methodology for rapid deployment.

Highlights of our accomplishments during Phase I of the project include

- Published a comprehensive Project Management Plan outlining the project schedule, deliverables and milestones, and resources requirements for a client organization of greater than 300 users across 24 local elections jurisdictions
- Deployed team members statewide to conduct change readiness assessments, business process analysis and confirmation of business requirements; all leading to the publication of the prioritized functional requirements for conducting software development
- Developed multiple releases of the Electus software customized to Maryland's business requirements and conducted prototype reviews of the system through various user forums
- Designed and managed a User Acceptance Testing (UAT) process for testing the Electus application against the rigorous business requirements; included training and mentoring of the SBEs UAT Committee made up of members of statewide representative elections jurisdictions
- Built, configured and deployed Saber's multi-tiered and fully redundant Maximum Availability Architecture (MAA) high-performance enterprise class hardware platforms in top security high-availability data centers for hosting the online application
- Conducted multiple cycles of data extraction, transformation and load (ETL) process to prepare the 24 separate elections jurisdictions legacy system databases for migration onto the HAVA-compliant centralized systems; this included three different types of legacy mainframe systems as well as other distributed platform Oracle systems.
- Developed and deployed custom tailored training programs designed specifically for Maryland's customized version of the Electus application; delivered Basic and Advanced

Maryland Centralized Voter Registration System Project (MDVOTERS)

training to approximately 300 statewide users in a formal classroom and lab format

- Defined and deployed significant volumes of new desktop computers and peripheral equipment for use with the new application software and networks; included significant logistical planning and deployment activities to displace existing equipment with new technology systems and training users on system access
- Designed, built and deployed network systems statewide (in-part via Network Maryland) for secure, closed intra-governmental agency data networking with private virtual circuits (PVC) to ensure a high-security, private point-to-point transmissions between the elections offices, the state board of elections and the high-availability data centers

MARYLAND
STATE BOARD OF ELECTIONS
P.O. BOX 6486, ANNAPOLIS, MD 21401-0486 PHONE (410) 269-2840

Gilles W. Burger, Chairman
Bobbie S. Mack, Vice Chairman
Joan Beck
Andy Jezic

Linda H. Lamone
Administrator

Ross Goldstein
Deputy Administrator

February 14, 2007

Mr. Nitin Khanna
Chief Executive Officer
Saber Software, Inc.
1800 SW First Street
Portland, Oregon 97201

Dear Nitin:

We are writing to thank you for Saber's key role in the successful implementation of MDVOTERS, Maryland's centralized voter registration system. As a result of this project, Maryland moved from using 24 local voter registration systems to a single HAVA-compliant system that successfully supported over 3 million registered voters in our statewide and local elections in 2006.

In helping Maryland make the transition to a statewide voter registration system, Saber presented a clear proposal, and followed this with a concrete plan to deliver the system and its new functionality. It is noteworthy that Saber delivered the MDVOTERS system statewide within a severe time constraint, beginning in April 2005 and ending in December 2005, beating the January 2006 deadline set in the Help America Vote Act. Saber's multi-track delivery approach—encompassing project management, data migration, infrastructure support, software customization, and executive level commitment to organizational change—proved vital to Maryland's success.

Your success in working with the State Board of Elections and the 24 Local Boards has significantly increased the productivity of our users across the state. Following the MDVOTERS implementation in December 2005, Saber provided a team of Maryland-experienced field support staff for travel to the 24 local elections offices. With each visit, these experts increased the knowledge of our users, their confidence in MDVOTERS, and, ultimately, their satisfaction with the new centralized system.

Maryland recognizes that Saber made a commitment to bring best-of-class project management and personnel to the MDVOTERS implementation project to make it a success. We are pleased to acknowledge your follow-through on that commitment. We

FAX (410) 974- 2019
MD Relay Service (800) 735-2258

Toll Free Phone Number (800) 222-8683
http://www.elections.state.md.us

151 West Street Suite 200
Annapolis, Maryland 21401

understand that Saber is planning to expand this implementation model to other states and we wish you the very best in your endeavors. We look forward to continuing to work with Saber in the year ahead.

Sincerely yours,

Mary Cramer Wagner

Mary Cramer Wagner
Director of Voter Registration

John F. Clark

John F. Clark
MDVOTERS Project Manager

3.2 Oregon Centralized Voter Registration System (OCVR)

Oregon Centralized Voter Registration System (OCVR)	
Name and Title	Jean Straight, Deputy SOS
Client Name	Oregon Secretary of State (OR SOS)
Business Address	136 State Capitol, Salem, OR 97310
Phone	(503) 986-1523
Email	jean.m.straight@state.or.us
Dates	October 2003 – Present
Users	350

Background

Under state legislation passed in 2001 and federal legislation passed in 2002, the State of Oregon is required to implement a single, uniform, official, centralized, interactive, and computerized statewide voter registration list that is defined, maintained, and administered at the State level.

Oregon issued a Request for Proposal (RFP) for the Oregon Centralized Voter Registration (OCVR) project in June 2003. This RFP was for a comprehensive set of software and services that included a complete Elections Management and Voter Registration software, and complete implementation services encompassing project management, data conversion, infrastructure and security hardware, implementation, documentation, and training.

The lifecycle of the OCVR project has included seven phases:

Phase	Processes
I	Complete Project Definition and Requirements Gathering
II	Develop Application and Deploy Initial System Architecture
III	Execute Nine Forms of Application Testing
IV	Conduct Training, and Execute Additional Testing and a Six-County Project Pilot
V	Complete Training and Statewide Implementation
VI	Project Completion and Closeout
VII	Warranty and Long-Term Support

Key deliverables of Phase I

- Capture the business requirements for Oregon's election management application using Joint Application Design (JAD) sessions
- Prepare for Phases II through VI by developing detailed plans and designs
- Prepare a Work Breakdown Structure (WBS), time schedule and cost estimates
- Deliver a Functional Hierarchy Diagram (FHD) and an Entity Relationship Diagram (ERD) in Oracle Designer.
- Prepare detailed documents for:
  - Requirements
  - A thorough set of test plans
  - Data conversion and migration protocols
  - Disaster recovery and business continuation plans
  - System security plans

Oregon Centralized Voter Registration System (OCVR)

  - Prototypes and test plans of the core business system
  - Network plans
  - Software and hardware configuration plans
  - Plans for accessing and extracting data from external agencies
- Search for potential duplicate voters on both an inter-county and intra-county basis.
- Develop a Service Level Agreement with counties and the Secretary for ongoing support and maintenance
- Develop detailed rollout plans for the system pilot test and the statewide test.

Key deliverables of Phase II

- Install prototyping equipment and environments
- Develop the core system configuration and architecture
- Conversion and migration testing for images and textual data
- Prototype remote access to the core system

Key deliverables of Phase III

- Iterative voter registration/elections management testing and changes to meet requirements, including Module testing, Multi-module testing, Data transfer testing, Load/stress testing, System security testing, Network testing, Integration testing, and User acceptance testing.
- Iterative data conversion/migration testing, data validation and changes

Key deliverables of OCVR Phase IV

- Create draft user documentation
- Provide onsite training
- Implement system for six counties
- Conduct architecture fail-over testing
- Document and report election implementation issues
- Complete User Acceptance Testing

Key deliverables of OCVR Phase V

- Create and deliver final training materials
- Provide onsite training
- Implement the system in full production mode

Key deliverables of OCVR Phase VI

- Deliver system documentation
- Deliver warranty support plan
- Close project and move into system support mode

Services provided for the OCVR project include project management; system analysis, design, development, and integration; database design and data migration; quality assurance; infrastructure and security implementation; system implementation and deployment (including training, testing, change management); gathering and analysis of the voter registration and election management requirements of the State and the thirty-six Counties; and design and development of the Electus software application.

Training and change management for the 350 users was an important, key criterion for Oregon, for which Saber developed a program called "No County Left Behind" to provide each of the thirty-six counties with a comfort level that provided county buy-in to the overall project.

3.3 Missouri Centralized Voter Registration System (MCVR)

Missouri Centralized Voter Registration System (MCVR)	
Name and Title	Carl Medley (CIO), Betsy Byers(Director of Elections)
Client Name	Missouri Secretary of State (MO SOS)
Business Address	P.O. Box 1767, Jefferson City, MO 65102
Phone	(573) 751-8471; (573) 751-0356
Email	carl.medley@sos.mo.gov; betsy.byers@sos.mo.gov
Dates	February 2004 – Present
Users	600 (increasing to 1000 on key days during the year)

Background

The Missouri Centralized Voter Registration (MCVR) project is exceedingly similar to the Oregon Centralized Voter Registration project (OCVR) described above with a few notable exceptions that we will describe here (instead of repeating all the same information described above). Saber (along with prime partner Maximus and local partner Rose International) was awarded the MCVR project in March 2004 with a target implementation date of November 2005.

The Missouri CVR RFP was very similar to the Oregon CVR RFP and requested comprehensive products and services to implement a HAVA compliant CVR system with full replacement of all elections management and voter registration functionality currently present in Missouri.

Though Maximus was the prime contractor in Missouri, there was no part of the project in which Saber was not involved. The State decided on Jan 1, 2006 to transfer prime responsibility to Saber because of the level at which we were involved in successful delivery to the state. Our primary responsibilities on the project were as follows:

- Providing the Electus software completely tailored to Missouri's requirements.
- Providing Subject Matter Experts (SMEs) in elections management and voter registration.
- Data Conversion services for migrating data from 116 counties into the Electus system.
- Interfaces to third party agencies (DMV, Vital Statistics, etc.) as required by HAVA.
- Documentation (End-User and Technical).

Our secondary responsibilities were as follows:

- Project Management and Quality Assurance
- Hardware, Infrastructure, and Security components
- Training

The major difference in functionality for Missouri when compared with Oregon is that in Missouri there are polling places (while Oregon is an all Vote-By-Mail State) and we implemented our comprehensive Polling Place module for Missouri (which we subsequently modified as appropriate and implemented for the other 4 states for which we did a SVRS project).

Missouri's key election statistics are as follows:

- Number of counties: 116
- Number of registered voters: 3.8M
- Number of polling places: 3,800 (Approximate)

Missouri Centralized Voter Registration System (MCVR)

- Number of concurrent users that the architecture will support: 800+ (with complete scalability to add as many users as needed). The Saber MAA (Maximum Availability Architecture) ensures 100% uptime (except in the case of a statewide disaster that disables both sites) with world-class security.

3.4 Mississippi Statewide Election Management System (SEMS)

Mississippi Statewide Election Management System (SEMS)

Name and Title	Madalan Lennep, Project Manager
Client Name	Mississippi Secretary of State (MS SOS)
Business Address	401 Mississippi Street, Jackson, MS 39201
Phone	(601) 359-6620
Email	mlennep@sos.state.ms.us
Dates	December 2004 - Present
Users	700

Background: Under the Help America Vote Act of 2002 (HAVA), Mississippi Secretary Of State (MSOS) was required to implement a statewide, centralized voter registration system for the State of Mississippi. Through the RFP process, MSOS selected Saber Consulting to develop and implement the system.

Goals of this Project

- Establish a secure single, centralized statewide voter registration system that meets or exceeds current county system capabilities and that meets state and federal requirements.
- Enhance the abilities of the counties to verify legitimate voter registrations, identify unqualified voter registrations, change, or purge incorrect or duplicate voter registrations, archive obsolete data, and use valid voter registration information as required by law.
- Enhance county and MSOS' abilities to provide real-time voter registration and election information.
- Meet state and county requirements for a functional, secure, robust, and scaleable voter registration and election management system.

The lifecycle of the SEMS project included five phases/stages

I. Project Planning and Design, II. Software Customization, III. User Acceptance Testing and Pilot, IV. Final Rollout, and V. Transition to maintenance and Post Implementation Support

Phase 1: Project Planning and Design, key deliverables:

- Capture the business requirements for Mississippi's Statewide Election management System (SEMS) using Joint Application Design (JAD) sessions and prepare the Gap Analysis Document (GAD).
- Analyses and document voter record validation process thru data interface with state agencies – Department of Public Safety; Mississippi Department of Health, and Administrative offices of Court (AOC)

Mississippi Statewide Election Management System (SEMS)

- Install prototype / test environment and deploy Core Application (Electus) for remote access
- Conduct County Survey to analyze their infrastructural requirements for using SEMS and document the GAPS to prepare Statewide Hardware Requirements.
- Conduct regional application demos to the users of all the counties, statewide and gather feedback.
- Review county data and prepare data and image migration plans.
- Prepare Technical Requirement and Network Design Document (includes Data Center Specifications)
- Identify Pilot implementation counties and User acceptance Test (UAT) group.
- Prepare detailed System Test Plan, UAT Plan, Pilot Implantation, and Statewide Rollout Plan.
- Document Helpdesk setup and post-implantation support requirements.

Phase 2: Software Customization, key deliverables:

- Customize software to meet application requirements as identified by the Mississippi VREMS.
- Data collection from pilot counties, analyses, mapping and first iteration migration.
- Develop system test scenarios and test scripts, finalize UAT test scripts.
- Draft User Document, Training Manual and troubleshooting guide.
- Iterative voter registration/elections management testing and changes to meet requirements, including Module testing, Multi-module testing, and Data transfer testing.
- Deliver and configure hardware to pilot counties for use with SEMS.
- Prepare Pilot County and UAT user training plan and identify training locations.
- Finalize data center design and requirements, procure hardware and software, and install Data Centers.

Phase 3: User Acceptance Testing and Pilot, key deliverables:

- Conduct training for UAT users and Pilot County users.
- Data collection from remaining counties, mapping and iterative data conversion/migration testing, data validation and changes.
- Conduct first iteration of UAT, receive, and implement feedback in the application for pilot readiness.
- Configure and setup data centers to the final locations and conduct readiness for pilot.
- Conduct pilot election with eleven counties to verify functionalities.
- Data Center testing and confirm to requirements including system security testing, network testing, and Integration testing.
- Deliver/configure hardware to remaining counties statewide, readiness check for production rollout.
- Prepare and finalize statewide Rollout Plan

Phase 4: Final Rollout, key deliverables:

- Modify and deliver final User Document and Training Manual.

Mississippi Statewide Election Management System (SEMS)

- Setup Helpdesk for ongoing user support
- Conduct user training statewide.
- Conduct architecture fail-over testing
- Complete User Acceptance Testing
- Deliver hardware to the counties statewide and configure for use with SEMS.
- Conduct training for UAT users and Pilot County users.
- Collect final production data from all counties, migrate, test, and deliver to users for ongoing use.
- Implement SEMS statewide in full production mode.

Phase 5: Transition to maintenance and Post Implementation Support, key deliverables:

- Deliver final System Documentation including data center architecture and disaster recovery plan.
- Deliver final User Documentation
- Deliver final Helpdesk process document and train users on helpdesk tracking application.
- Close project and move to system support

Services provided for the SEMS project include project management; system analysis, design, development, and integration; database design and data migration; data center installation and configuration; quality assurance and system testing; infrastructure and security implementation; system implementation and deployment (including client hardware, training, testing, change management) and providing long-term user support and help-desk.

3.5 New Jersey Statewide Voter Registration System (SVRS)

New Jersey Statewide Voter Registration System (SVRS)	
Name and Title	Michael J. Gallagher, HAVA Administrator
Client Name	New Jersey Office of the Attorney General
Business Address	HAVA Unit Quakerbridge Road Quakerbridge Plaza, Bldg #9 – 3rd Floor Hamilton, NJ 08619-1241
Phone	(609) 588-4535
Email	michael.gallagher@lps.state.nj.us
Dates	March 1, 2005 to Present
Users	1,216 (State, County, and Municipal workers)

Background

The state of New Jersey was seeking to acquire and implement an integrated voter registration and election management system across New Jersey's twenty-one counties. The system was to provide compliance with the Help America Vote Act and to fulfill the State's election plan. Saber provided the complete solution, comprised of software, hardware, training, hosting, and ongoing maintenance support. The solution included the Design, Development, Implementation, and Hosting of New Jersey's Statewide Voter Registration System (SVRS). The Saber team, including its subcontractors, PCC Technology Group and Aradyme, had already successfully implemented this solution in four other states. The ElectioNet product is a robust, browser-based J2EE application.

Saber's solution involves hosting the central server environment in Connecticut and the Testing/Training environment in Michigan. The entire database is replicated real-time to the testing database to provide additional back-up security. Additionally, each of the twenty-one counties was provided with two servers for application and database services. Each county's data is replicated to their database server to provide on-site report generation and a back-up environment to provide immediate service in the event of a central server outage. Saber provided and supports 650 end-user workstations that each includes a label printer and a bar-code reader. Over 200 laser printers and image scanners were included in the end-user installations throughout the fifty-four individual county election offices and two state offices.

Training on the application was provided to all 650 county elections users and 566 municipality offices. After conversion of each county's data, on-site mentoring was provided to all fifty-four county offices, both initially and several months after implementation, to ensure there was no usability issues with the staff. The training culminated an extensive Change Management campaign with all county users. The state required a full-bodied CM process to ensure buy-in from all county users, as there was a wide diversity of sophistication across the various users and the systems they had been using.

The New Jersey SVRS project has completed the implementation and is now focused on an extensive enhancement program.

3.6 Additional Elections References

In addition to the key references provide above, please review these summaries of Saber's other elections references:

Project	Summary
Iowa Standard Voter Registration System (I-VOTERS) ***Saber Corporation, as prime contractor, completed this project on time and within budget.***	The I-VOTERS project was a Primary election type run involving 400 users and 220,000 registered voters. The State of Iowa HAVA plan called for the implementation of a single, uniform, official centralized, interactive computerized voter registration system. The State contracted with Saber Consulting, Inc. to develop, maintain, and administer the system. The system coordinates with other State Agency databases, including the Department of Transportation (DOT), Office of State Court Administrators (SCA), Department of Public Health (DPH) and National Change of Address (NCOA). **Similarities** The I-VOTERS project is very similar to Wyoming's VRS as it required comprehensive products and services to implement a HAVA-compliant VRS system with full replacement of all elections management and voter registration functionality currently present in Iowa. It required extraction of data from the county systems and integration of that data into the centralized database. This project required statewide implementation and training services to prepare the counties and the state to utilize the new system. The project objectives included: • Establish a secure single, centralized statewide voter registration system that meets or exceeds current county system capabilities and that meets state and federal requirements. • Enhance the abilities of the counties to verify legitimate voter registrations, identify unqualified voter registrations, change or purge incorrect or duplicate voter registrations, archive obsolete data and use valid voter registration information as required by law. • Enhance Local Boards of Elections (County) and SBE abilities to provide real-time voter registration and election information. • Meet state and county requirements for a functional, secure, robust and scaleable voter registration and election management system. **Key Outcomes** Saber was selected to provide Electus, Saber's voter registration and election management system, customized to meet the State of Iowa's needs, and to collaborate with the State to implement all 99 counties on the system. The purpose of the project was to modify the base software product to address any gaps between current functionality and the requirements identified by the State.

Project	Summary
Montana Centralized Voter Registration System (MTVOTES) ***Saber Corporation, as prime contractor, completed this project on time and within budget.***	The MTVOTES project was a Primary election type run involving 250 users and 220,000 registered voters. Under the Help America Vote Act of 2002 (HAVA), Montana Secretary Of State was required to implement a statewide, centralized voter registration system for the State of Montana. This project was sole sourced to Saber. Since the State of Montana had an existing Project Management contract with Maximus they retained Maximus as prime to provide client-side project management services; Saber provided all services related to delivering our Electus product for HAVA compliance. **Similarities** The MTVOTES project is very similar to Wyoming's VRS as it required comprehensive products and services to implement a HAVA-compliant VRS system with full replacement of all elections management and voter registration functionality currently present in Montana. It required extraction of data from the county systems and integration of that data into the centralized database. This project required statewide implementation and training services to prepare the counties and the state to utilize the new system. The project objectives included: • Establish a secure single, centralized statewide voter registration system that meets or exceeds current county system capabilities and that meets state and federal requirements. • Enhance the abilities of the counties to verify legitimate voter registrations, identify unqualified voter registrations, change or purge incorrect or duplicate voter registrations, archive obsolete data and use valid voter registration information as required by law. • Enhance Local Boards of Elections (County) and SBE abilities to provide real-time voter registration and election information. • Meet state and county requirements for a functional, secure, robust and scaleable voter registration and election management system. **Key Outcomes** Services provided for the project include project management; system analysis, design, development and integration; database design and data migration; quality assurance; infrastructure and security best practices; system implementation and deployment (including training, testing, change management); gathering and analysis of the voter registration and election management requirements of the State and the Counties; and design and development of the Electus software application. A functional track-based approach was used to execute the project rather than the traditional phase-based approach. By organizing work into tracks, the project was able to move

Project	Summary
	forward in parallel work streams that allowed milestones to be reached sooner than if the project were strictly organized in sequential phases. • Phase 1. Project Management and Administration • Phase 2. Software Customization and Interface Development • Phase 3. Data Migration • Phase 4. Data Center Implementation • Phase 5. County Installation • Phase 6. Change Management, Training and Support
Idaho Statewide Voter Registration System ***Saber Corporation has been re-assigned this contract through its purchase of Covansys Public Sector. This project was completed on time and within budget.***	The state of Idaho and the Secretary of State's Office is seeking to acquire and implement an integrated voter registration and election management system across Idaho's forty-four counties in compliance with the Help America Vote Act (HAVA) and in alignment with the State's election plan. **Similarities** The Idaho SVRS project is very similar to Wyoming's VRS as it required comprehensive products and services to implement a HAVA-compliant VRS system with full replacement of all elections management and voter registration functionality currently present in Idaho. It required extraction of data from the county systems and integration of that data into the centralized database. This project required statewide implementation and training services to prepare the counties and the state to utilize the new system. The project objectives included: • Establish a secure single, centralized statewide voter registration system that meets or exceeds current county system capabilities and that meets state and federal requirements. • Enhance the abilities of the counties to verify legitimate voter registrations, identify unqualified voter registrations, change, or purge incorrect or duplicate voter registrations, archive obsolete data, and use valid voter registration information as required by law. • Enhance Local Boards of Elections (County) and SBE abilities to provide real-time voter registration and election information. • Meet state and county requirements for a functional, secure, robust, and scaleable voter registration and election management system. **Key Outcomes** The solution provides election officials with a unified solution for centralized voter registration and complete election systems management. From voter file management to absentee voting, the system is focused on the security and integrity of the election process. It is designed to automate virtually every aspect of election office operations to maximize productivity, increase

Project	Summary
	efficiency, and standardize election workflow.
Rhode Island Statewide Voter Registration System ***Saber Corporation has been re-assigned this contract through its purchase of Covansys Public Sector. This project was completed on time and within budget.***	Covansys, from whom Saber has acquired all projects, provided the Rhode Island Secretary of State with a proven, established, browser based, real-time, HAVA compliant turnkey Statewide Voter Registration system. **Similarities** The Rhode Island SVRS project is very similar to Wyoming's VRS as it required comprehensive products and services to implement a HAVA-compliant VRS system with full replacement of all elections management and voter registration functionality currently present in Rhode Island. It required extraction of data from the county systems and integration of that data into the centralized database. This project required statewide implementation and training services to prepare the counties and the state to utilize the new system. The project objectives included: • Establish a secure single, centralized statewide voter registration system that meets or exceeds current county system capabilities and that meets state and federal requirements. • Enhance the abilities of the counties to verify legitimate voter registrations, identify unqualified voter registrations, change, or purge incorrect or duplicate voter registrations, archive obsolete data, and use valid voter registration information as required by law. • Enhance Local Boards of Elections (County) and SBE abilities to provide real-time voter registration and election information. • Meet state and county requirements for a functional, secure, robust, and scaleable voter registration and election management system. **Key Outcomes** The solution provides election officials with a unified solution for centralized voter registration and complete election systems management. From voter file management to absentee voting, the system is focused on the security and integrity of the election process. It is designed to automate virtually every aspect of election office operations to maximize productivity, increase efficiency, and standardize election workflow.

4. PROJECT MANAGEMENT METHODOLOGY AND APPROACH

Saber's project management approach has evolved from our many successful implementations, and follows the use of a track-based methodology founded on the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK®). Project management is the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed our clients' needs and expectations from a project.

Among the lessons we have learned from these successful implementations, is the use of a functional or track based alignment of the project activities. The Tracks Approach is a methodology that has evolved and been very successfully implemented in various Electus Implementations as well as other large projects.

While the track approach accommodates all of the needed activities for various project phases in line with the SDLC, it allows for a higher degree of control over the various correlated activities of one track and better coordination of time and resources between tracks. The track-based approach allows for acceleration of a project schedule and for easier management and oversight of the project for Saber as well as our Clients. The tracks approach greatly enhances the project's chances for success by:

- Alleviating the complexity of large projects by dividing the project into several smaller projects (tracks) and assigning a track lead for each who is functionally experienced in that track.
- Creating a higher sense of focus and ownership in the tracks leads as they are assigned on fulltime bases and are held accountable for the success of their tracks rather than individual assignments.
- Creating more time for the project manager to manage and coordinate rather than spend the time on technical details.

Saber's standard tracks can be aligned with phases. However, strict phase-based contracts can sometimes be restrictive as different tracks can have different progress rates. Therefore, if the contract does not allow a phase to start until the previous one is completed, certain activities in the projects will come to a halt unnecessarily. The tracks alignment of the project allows a certain degree of "independence" for the various tracks to proceed as quickly as possible.

4.1 Saber Tracks Approach

Saber's standard implementation includes the following six tracks (see Figure 2). We have customized this approach to five tracks for the WyoReg project, where we have merged the agency interfaces track with the software customization track:

- Project Administration
- Software Customization (Agency Interfaces)
- Data Migration
- Infrastructure
- Implementation

The various activities of each track are managed by a track leader while the activities across tracks are coordinated by the overall project manager to ensure correct timing of activities.

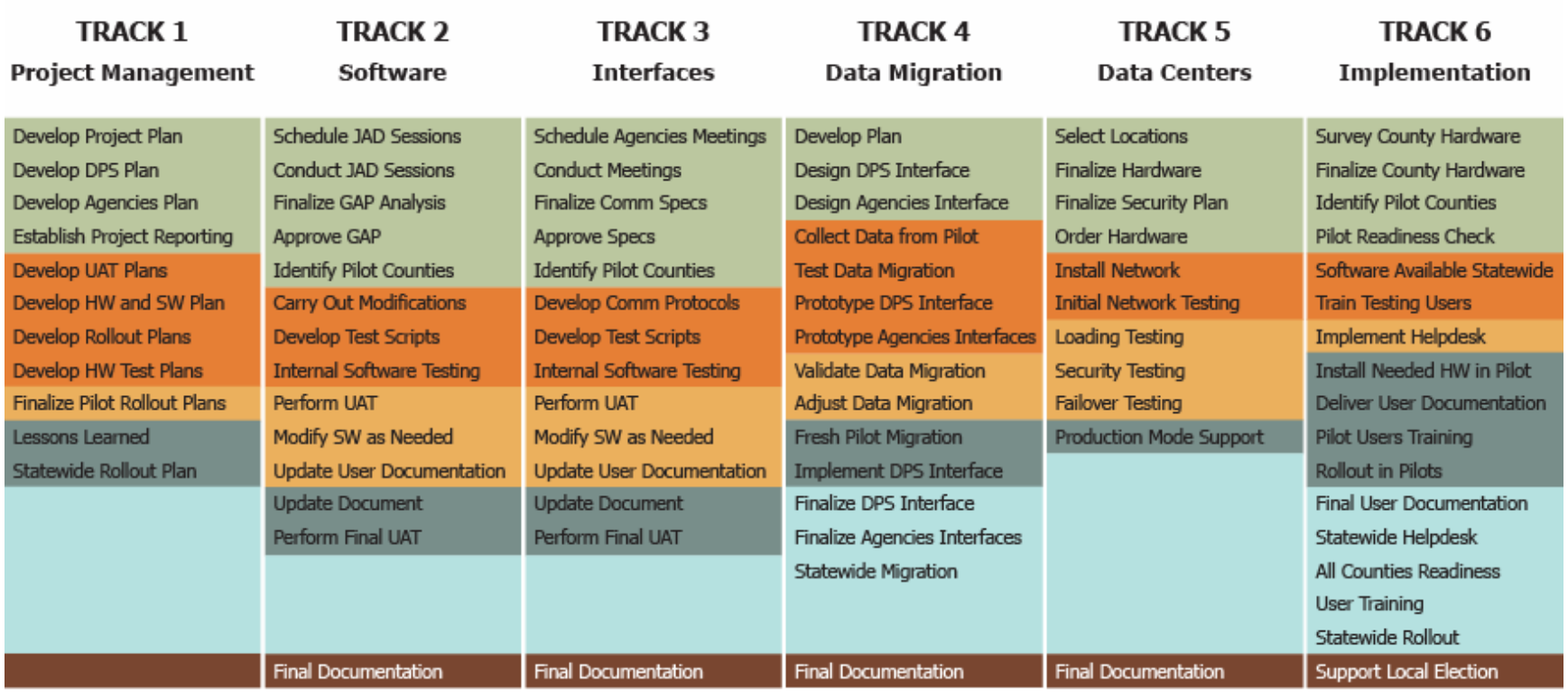

Figure 2. Project Tracks

Color Legend:

1. Project Management/Initiation
2. Software Customization and User Acceptance Preparation
3. Conduct UAT and Preparation for Production Phase
4. Pilot and Production
5. Post-Implementation Close-out and Support

The Project Administration track starts day one and finishes when the project is completed. The developed plans include:

- Business Continuity Plan
- Data Migration Plan
- Infrastructure Plan
- Ongoing Status Reports
- Organizational Change Management Plan
- Pilot Implementation Plan
- Project Plan (software development plan, communication plan, risks plan, etc)
- Program Transition Plan
- System Implementation Plan
- Security Plan
- Test Plan
- User Training Plan

The Project Administration Track Lead manages all the work plans and tracking mechanisms that are routinely handled by the Project Manager in other software development models. By shifting these responsibilities to a Project Administration Lead, Saber ensures that all of the project's plans will be constructed when they are needed, are consistently detailed, and are held to the highest standards. The Project Administration Track Lead reports to the Functional Manager. The plans that are developed and supervised by the Project Administration Lead include:

- **Business Continuity Plan.** A detailed plan describing Saber's recommendations and guidelines to business continuity and disaster recovery.
- **Data Migration Plan.** A detailed plan to the methodology, extraction, loading, verification and scheduling of migrating the data from the various old systems to the new system. The plan will include the phases of pilot and final rollout.
- **Infrastructure Plan.** A complete list of approved hardware including selection of data centers locations, development, test and production servers, desktop and network equipment. The plan should have the final costs and required licenses. The plan should also identify the roles and responsibilities in terms of supporting the infrastructure
- **Interfacing Plans.** If applicable, a plan to describe the technology, specifications and protocols for communicating with external systems and/or agencies.
- **Ongoing Status Reports.** The project manager will develop and submit the needed weekly, monthly and quarterly status reports. The standard reports can be found on the ePMO site at www.sabercorp.com and will be accessible to the State.
- **Pilot Implementation Plan.** A plan that defines the criteria for selecting pilot users and sites if applicable. The plan should integrate with testing and full implementation plans.
- **Program Transition Plan.** A plan to describe the approach, activities and scheduling to transition from project to program including the terms and conditions of a Service Level Agreement for ongoing maintenance and support.
- **Project Plan.** A detailed guideline to the successful completion of the project. Will include all sub plans like, software development plan, communication plan, risks and assumptions, change management protocols, status reporting, in scope and out of scope and lessons learned protocols.
- **Security Plan.** A detailed plan describing the security architecture of the system. The plan will also include the security features and measures of the application.
- **System Implementation Plan.** A comprehensive plan describing the schedule, checklist for preparedness and a description of the cut-off and rolling the users into the

new system. The plan should include user constraints like work schedules, events, holidays and vacations.

- **Test Plan.** Includes the various test plans including software and hardware. The plan will define the User Acceptance Criteria for each deliverable in addition to roles and responsibilities of Saber and users.
- **User Training Plan.** A detailed plan for the types, content, and schedule of the user staff training including the expected set of user and technical documentation and help delivery mechanisms.

The project manager is the overall authority to drive the project schedule and coordinate with other track leaders to ensure timely delivery of various work products and deliverables.

The **Software Customization Track** lead will be responsible for:

- **Joint Application Development (JAD) Sessions.** Schedule and conduct the needed JAD sessions with the users and subject matter experts from the user groups. The purpose of the task is to verify the requirement of the project and analyze the gaps in the existing software.
- **Finalized Requirements Document.** The result of the JAD session is either Functional Requirements Specifications (FRS) Document or a Gap Analysis Document (GAD).
- **Customize the Software.** An iterative prototyping cycle of customizing the software and involving key users to verify and incrementally approve the changes.
- **Develop Test Scripts.** The development of a complete set of test cases and scripts to test the application including changed and customized modules.
- **Internal Software Testing.** Execution of the identified test scripts by Saber QA manager and the supporting team to ensure successful testing by the users.
- **Accommodate Feedback.** The development team applies the needed changes and bug fixes based on the feedback from the internal and user testing.
- **Update User and Technical Documentation**. Update user and technical documentation, online and printed, based on the customization of the software.

The **Interfaces track** lead is responsible for the following:

- **Interface Requirements Document.** Identify needed data exchange interfaces in the application. Using JAD sessions, define detailed requirements for each interface with stakeholders.
- **Interface Specifications and Protocols Agreement.** Define specifications for each interface. Define protocols with the interface partners, who are the external users or suppliers of the data being exchanged (agencies, vendors, etc.). Document partner agreement to the protocols. Update the Interface (Test) Plan based on the agreement.
- **Build Interfaces.** Develop the interfaces to third party systems or agencies.
- **Develop Interface Test Scripts.** The development of a complete set of test cases, test data, and test scripts to exercise all possible interface specification logic, protocols, and error handling.
- **Internal Interface Testing.** Execution of test scripts by the Saber QA manager and the supporting team to ensure successful pilot testing with the partner(s).
- **Pilot Interface Testing with Partners.** Develop procedures for implementing the interface. Conduct interface testing with partners.

- **Verify and Finalize Interface Specifications.** Work with interface partners to review and approve the correctness and completeness of the interface prototype. This process may be repeated to accommodate changes to specifications.
- **Update User and Technical Documentation.** Update user and technical documentation, online and printed, based on the final interface specifications.

The **Data Migration track** starts as early as possible in the project. The activities that are supervised by the Data Migration Track Lead include:

- **Pilot Data Collection**. Collect a complete set of data files from all source systems or from a representative sample of systems.
- **Data Mapping & Translation**. Analyze the received data and develop detailed documentation for translation and mapping of old code values to new ones.
- **Approve Data Mapping & Translation**. Work with the user groups to review and approve the data mapping and translation documents.
- **Pilot Data Migration**. Develop the procedures to migration the data into the new system as per the approval of the mapping and translation documents.
- **Verify Pilot Data Migration**. Work with the user groups to review and approve the correctness and completeness of the data migration. Depending on the approved level effort, this process may be repeated to accommodate corrections and possible data cleansing.
- **Final Data Collection**. Collect the data from the various sources in accordance with the implementation plan schedule for final production rollout.
- **Final Data Migration**. Execute the tested and approved procedures to migrate the data to the new system. Depending on the approved level effort, this process may be repeated to accommodate corrections and possible data cleansing.

The **Infrastructure track** starts also very early on the project. The activities that are supervised by the Infrastructure Track Lead include:

- **Select Data Centers**. Analysis and final decision on the selection of the location(s) of the data center. This task includes ensuring the suitability of the selected site to host the approved hardware and security equipment as per the relative plans.
- **Order Hardware & Software**. Submit purchase orders for all approved hardware and security equipment. Submit purchase orders for all software licenses and tools required for the architecture. May include data center, network and/or desktop equipment.
- **Hardware & Software Installation**. Complete the installation and configuration of the data center(s). The task includes developing all needed documentation of the configuration of the equipment including the hardware and software license itemized lists for configuration and inventory management purposes.
- **Network Configuration**. Complete the installation and configuration of all network and security equipment. This task includes developing all needed documentation of the configuration and settings for on-going maintenance purposes.
- **Environment Set-Up.** Complete the database installation and configuration of the development, test, training, and production environments for the project. Environments must support software customization, interface, data migration, and implementation activities.

- **Install User Hardware**. If applicable, complete the installation and configuration of needed user hardware (desktop computers, printers, scanners, barcode readers, label printers, etc)
- **Data Centers Testing**. As per the approved Testing Plan, conduct agreed upon hardware tests including fail over, loading, backup and recovery and security testing.

The **Implementation track** follows the plans identified in the project management track. The activities that are supervised by the Implementation Track Manager include:

- **Survey Existing User Hardware**. If applicable, survey all hardware for existing users, networking and connectivity to assess their preparedness for the new system. This process can be carried out for the whole user group or for pilot first and then the full group.
- **Train Testing Users.** Provide basic training for the user group identified to perform testing.
- **Perform User Testing.** Users will apply the test scripts to test the software customization and interfaces to verify preparedness for deploying the software.
- **Support Pilot Implementation**. Provide the needed support to pilot users during pilot implementation.
- **Verify preparedness for Rollout.** Verify all users' infrastructure, connectivity and hardware is installed and configured. Ensure all relevant users are trained, verify data migration progress and communicate rollout schedules with users.
- **Train Users**. Provide training for all users in coordination with the enterprise implementation plan.
- **Help Desk**. If applicable, setup and commission a help desk for the new system.
- **Enterprise Implementation**. Provide remote and possible onsite support during the implementation and cutover.

4.2 Project Activities

Key activities within our track-based approach include:

Work plan management: At the beginning of each project, we develop a detailed work plan with our client partners, mutually agreeing on schedules, tasks, and hourly budgets for each individual (for both the client's personnel and Saber's personnel). This gives each person a clear understanding of responsibilities, and it becomes his/her statement of personal commitment to the project for the phase. Every week, each individual completes a turnaround document specifying hours expended per assigned task and updating estimates to complete those tasks. This process establishes a culture of personal accountability on the project, as well as maintaining a fact-based understanding of project status.

Scope management: The aggressive time line of this project mandates that scope management is the single most important factor in maintaining budget, schedule, and overall success. All parties must agree that the work program is correct from these four perspectives:

1. The right transactions are included.
2. The work estimates are reasonable.
3. The personnel commitments can be delivered.
4. The schedule can be achieved. We recognize that some changes, particularly those resulting from legislative or policy changes will occur and need to be addressed. Beyond

those changes absolutely required by outside forces, the standard response to new high-priority requirement(s) must be to remove or defer lower-priority requirement(s) so that resources and schedule remain unchanged.

Communication management: Saber's approach focuses on regular, proactive communication with all involved project stakeholders. Regular communication internally and externally with the project team during development helps maintain a positive attitude toward upcoming changes. We create a project website via the intranet as a central location for posting project information. Our innovative approach to communicating provides project team members easy access to real-time project information.

Quality/Value/Success: Saber focuses on achieving and sustaining high value delivery for our clients. Key elements include: expectation interviews to document each stakeholder's personal view of success; a Quality Plan with actions and metrics focused on achieving those success objectives; and Quality Action teams that monitor the metrics and outcomes and update the plan accordingly. Quality/Value/Success is our formula for achieving long-term client satisfaction.

Risk Management: The Saber Project Manager is the owner of the Risk Mitigation Plan and tracks mitigation transactions to completion. Our project risk management process has four steps: planning, assessment, handling and reporting. These steps work in an iterative, ongoing process to identify and respond to risks to minimize impact to the project. All project team members are involved in the risk mitigation process. Any team member can identify risks, implement risk mitigation actions, and escalate attention to risks when necessary. However, our risk management approach focuses on minimizing risk before design and development begin. During the proposal process, Saber identifies known project risks and mitigation plans. Based on the initial assessment of project risks, we will assess and prioritize project risks, identifying anything those items that can be addressed before the project begins.

4.3 Our Project Approach

4.3.1 Project Management

Saber follows standard project management approaches based on the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK®). Project management is the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed our clients' needs and expectations from a project. Meeting or exceeding stakeholder needs and expectations invariably involves balancing competing demands:

- Scope, time, cost, and quality
- Stakeholders with differing needs and expectations
- Identified requirements (needs) and unidentified requirements (expectations) critical to overall success for the project

Project Management starts with the company and the culture it promotes. Over the years, Saber has developed process, methods, and tools that enable our project managers to be successful. The starting point is hiring the right kind of project managers. Saber hires experienced Project Managers and promotes internally qualified candidates. We train our Project Managers in the appropriate tools and methods. Our culture promotes attention to detail and contingency planning. We have a very detailed process to monitor and assist in delivering large engagements. We have established an Enterprise PMO (ePMO), our internal corporate project management office, to standardize tools and methods that can be shared across all projects. In addition, the

ePMO provides management dashboards and provides early warning signals. The PMO executive manager, Mohamad Kahlout, reports directly to Saber's CEO.

Upon commencement of project, Saber will work with the client's project team to perform project startup and initiation. Saber will:

1. Establish a project team with appropriate staff.
2. Meet with management and staff.
3. Setup a work environment.
4. Conduct a formal kickoff meeting with state team.

Saber will develop a plan in coordination with the client's project team and will gain agreement on the plan from all stakeholders. This plan will contain the scope, schedule, staffing plan (Saber and the client), cost, and risk items associated with the phase, as well as documented assumptions. Our Project Management approach and training takes into account all facets of project management (as specified by the Project Management Body of Knowledge from the Project Management Institute) including:

Project Initiation

- Creation of key project governance documents including:
  - Project Plan and Schedule
  - Staffing Matrix and Organization Chart
  - Quality Assurance Plan
  - Risk Management Plan
  - Change Control Plan and processes
  - Communications Plan
  - Issues Management Plan
- Project kick off meeting with key stakeholders
- Establish project steering committee
- Define project reporting requirements

Project Controls

- Project risk monitoring and evaluation
- Issues tracking and resolution
- Regular steering committee meetings
- Ongoing contract and deliverables management
- Frequent and consistent status reporting

Project Execution

- Onsite visits to remote locations and county election offices to communicate with users and to conduct readiness assessments and equipment gap analyses
- Training and user documentation – both web based and training facility settings
- Pilot implementation of the system with Lessons Learned briefing for Steering Committee
- Statewide implementation of the system, using a phased rollout approach

Project Close and Transition to Program

- Document system acceptance with steering committee members
- Deliver final project and system documentation deliverables to state
- Present Lessons Learned to State
- Deliver recommendations for transition to ongoing program and system support

In coordination with the client's project team, Saber executes and controls the plan to achieve the agreed upon functionality within each phase. This will include performing impact assessment on proposed changes in scope (for example, a Change Control Impact Assessment), identifying risks and issues, developing and executing risk mitigation plans, assigning specific tasks to specific individuals, tracking resource effort and progress on tasks, and managing the staff and project activities necessary to complete the project successfully. SOS will own the communication's process with other stakeholders. Saber will propose and draft regular project communications, but all communications external to the project teams will be either undertaken by the SOS or approved prior to dissemination.

At the completion of each phase, Saber will perform project closedown activities in coordination with the client's project team. This will include a review of project metrics and general "lessons learned" from project participants, and will generate a Post-Implementation Evaluation Report (PIER). The PIER will minimally include a review of the quantity and type of issues encountered, general root causes for the issues, and recommendations for improving the subsequent phase. A comparison of actuals to estimates for total effort, staff-months, number of configuration items, etc., will also be conducted, yielding input for estimates on subsequent releases. A formal review of the PIER document will be conducted with the client's project leadership team. This will be completed within one month of phase (or major release) implementation.

In describing our approach, we highlight three Saber team differentiators:

1. **Methodology –** The comprehensive framework that provides the starting point for all of our large, complex projects.
2. **Project Approach –** How we have applied the methodology to our client's unique requirements to develop the overall shape of the project.
3. **Management Approach –** The key management techniques we use throughout the project to ensure success.

The following activities will be accomplished during project startup. The project team, the stakeholders, management, and project staff will have multiple meetings to understand expectations and build a detailed project plan that will be mutually agreed to by Saber and the State.

- Project Kick-off Meeting
- Communication Plan
- Quality Assurance Plan
- Risk Management Plan
- Change Management Plan
- Infrastructure Setup
- Team Ramp-Up And Training
- Meeting Schedule – Schedule for meetings with state team

4.3.2 Infrastructure Validation

The infrastructure validation provides early familiarization of the entire technical architecture. The overall goal is to help ensure that the technology infrastructure aligns with the business needs of the organization. The following key tasks are performed:

Review Technology Physical Architecture: Here, the architecture team reviews and confirms the technical requirements for the development, execution and operation architectures for the project. The application development, production, testing, training, and data conversion environments are validated against the architectural designs, which are based on our initial understanding of the system requirements. The result of this validation is a gap analysis, which identifies any infrastructure mismatch between the baseline architecture proposed and redefines the architecture based on the revised system requirements. These designs are developed utilizing architectural best practices and are intended to take into consideration major component issues such as performance, reliability, and security**.**

Review Security Platform: During this task the architecture team determines how security requirements are met across the hardware, application, system software and the system. For example, Saber reviews current security and authentication procedures for their current initiatives and determine whether password, PIN or other methods are required. This determination is based security requirements as well as assessment of the impact of exposure to the client's data.

Analyze Performance Estimates: In order to size the hardware and application software to support the overall system response time, the Saber team reviews the transaction estimates with our client. We confirm the estimated workload provided and incorporate any additional sizing estimate changes resulting from the review of the transactions into an estimating model. During requirements phase, we would need more details on volumetric information that will define the initial capacity plan.

4.3.3 Technical Architecture

The goals of this activity are to analyze the problem domain, establish a sound architectural foundation, and eliminate the highest risk elements from the project. This activity will completely address the technical architecture finalization (deployment and implementation models), design of the functions, and specification of the user interface design, refining of all system and applications requirements and initiate data modeling related to the proposed customer-centric database.

The team will gather requirements on the following and other technical features:

- Application Object Reusability, Processing
- Integration Requirements
- Interface to Imaging System
- Bulk Printing, Document Generation services
- Bar Code
- Parameter Processing
- System Capacity, Availability and Response times
- Printer and Print Controls
- Data Backup and Recovery
- Data Archiving, Retention and Purge Requirements
- Disaster Recovery Requirements

- Leveraging Current Environment Investment
- Remote Software Upgrading
- Reporting Component
- Help Systems

This would allow the elaboration of information gathered in the infrastructure validation phase. Our team analyzes and validates the designs for the development, production, and other environment architectures. In this approach, we can provide a more focused review of each architecture component and help ensure an integrated and functional physical architecture. The Saber team will design the execution architecture to focus on determining what run-time services and control structures are required for the functionality, whereas the operations architecture focuses on the tools and services that are necessary to keep the system operating in each computing environment. To meet operational challenges, the operations management plan is developed to address security, general operations, storage, configuration, report/spool management, and performance. As a part of our risk mitigation strategy, we also develop a plan that outlines the procedures required to continue business in the unlikely event that the system is not available.

Other tasks performed for each type of technical architecture include:

- Prepare Detailed Design of Security Architecture.
- Identify Standards and Procedures for the development effort utilizing the Unified Modeling Language and Rational Suite of Tools.
- Identify specific software objects that can be used as design/templates for additional functions throughout the development effort.
- Develop test plan and documentation to support each architectural component.
- Prepare logical and physical network and hardware diagrams.

4.3.4 Requirements Gathering and Analysis

The Analysis and Requirements definition includes those tasks required to sufficiently and comprehensively define the functionality, to define the requirements for a logical database schema for the project, and to define the interface requirements to all external programs and/or systems. Additionally Saber will define the scope of the data conversion effort focusing on analyzing the data and doing some preliminary mapping of existing data fields (from existing legacy systems) into the architectural concept.

Saber adopts the Dynamic Systems Development Methodology (DSDM) for software development and customization. This track includes the Agency Interfaces Development track as well. DSDM is a well-established and proven Rapid Application Development (RAD) methodology that based on prototyping, iterative development, and frequent involvement of users. The requirements gathering in the DSDM methodology is based on Joint Application Development (JAD) sessions conducted throughout the system development lifecycle.

The first task is to establish the initial scope of the project that is established from the Proposal and the requirements.

Analysis

Saber uses Joint Application Development sessions for Requirements Gathering and Validation. A JAD session is a facilitated workshop using team-based information gathering and decision-making techniques designed to accelerate business planning and development.

During this phase, Saber will prototype limited scope functionality to engage the users to provide feedback on design and presentation concepts that may be used to frame the application. These prototypes are very limited in scope and will be released to a focus group called the JAD team/core team that will be arranged by the state project manager. Saber has found that this level of engagement early in the requirements/design phase of the project allows many of the "look and feel," screen navigation, and grouping of screens issues to be addressed early in the lifecycle, thus reducing defect levels and ensure that the users are familiar with the constructs of the system before testing commences.

The objectives of this task are to:

- Identify requirements from the customer, the environment, and the experience of the technical community
- Build well-formed requirements
- Organize the requirements into a Functional Requirement Specification (FRS)
- Present the FRS in various representations for different audiences

Each requirement should possess the following properties:

- Abstract: each requirement should be implementation independent;
- Unambiguous: each requirement should be stated in such a way so that it can be interpreted in only one way;
- Traceable: for each requirement it should be feasible to determine a relationship between specific documented customer statement(s) of need and the specific statements in the definition of the system given in the FRS as evidence of the source of a requirement; and
- Validated: each requirement should have the means to prove that the system satisfies the requirements.

Requirements provide the foundation for both software engineering and project management activities, and all stakeholders must be committed to following an effective requirements process. The requirements engineering process brings together all stakeholders in the software project. The stakeholders include customers, users, business analysts, developers, testers, documenters, project managers, and customer managers. Requirements Engineering consists of two primary components: Requirements Development and Requirements Management.

Requirements Development is the process of creating high-quality requirements. Requirements Management involves managing those requirements as they change throughout the software development lifecycle.

The end product of analysis is the Functional Requirements Specification (FRS). This leads to design products like the ERDs, FHDs, UI designs, gap analysis documents, and the development specifications. In the case of Electus, since we already have a baseline application the FRS will be a Gap Analysis Document (GAD) between what exists in the application and what needs to changed to satisfy the needs of the state specific processes and laws.

The FRS is mapped back to the requirements to identify the gaps - what is the initial set of enhancements in the FRS from the requirements and what requirements are no longer needed. This gap analysis results in the Requirements Traceability Matrix (RTM).

The gap analysis is communicated to the client and discussions are held to identify what change orders need to be produced to accommodate these changes to the initial scope.

- New requirements are first analyzed for their priority and the time of need with the user group.
- A Work Breakdown Analysis is conducted to estimate the resource and time requirement.
- Discussions are held to see if the change order is a financial change order that the client will pay for and we get more resources to do the extra work.
- Per the 'Timeboxing' approach of DSDM, alternatively, it could be a time-change-order, meaning we drop some items from the existing scope, to undertake the new urgent requirements. If there is an overall increase in scope then that is quantified and established in a change order, with the Time, Resource, Scope and Cost Impact.

This process helps define the new scope of the project and development and delivery commences per this.

Review and Signoff Process

Our methodology, which includes JAD sessions for requirements discovery, collaborative system design and testing, prototypes, and pilot implementations directly, involves users and management at all phases of the project. Concurrence between the system and the requirements is gained collaboratively, making sign-off more of an official event rather than a separate review process.

4.3.5 Business Modeling

Saber will work with our client's Subject Matter Experts (SME) to develop a high-level business model. This exercise will be used to identify and determine how functions will be prioritized and reviewed. Saber will facilitate the modeling sessions with client participation.

The purpose of business modeling is:

- To understand the structure and the dynamics of the organization in which a system is to be deployed (the target organization)
- To understand current problems in the target organization and identify improvement potentials
- To ensure that customers, end users, and developers have a common understanding of the target organization
- To derive the system requirements needed to support the target organization

To achieve these goals, the business modeling describes how to develop a vision of the new target organization, and based on this vision define the processes, roles, and responsibilities of that organization in a business model and a business object model.

4.3.6 Design

The goals of detailed system design are to establish a sound architectural foundation for the project. This phase will completely address the technical architecture finalization (deployment and implementation models), refining of all system and applications requirements and finalizing all logical models related to the proposed customer-centric database. The design will support the business and technical requirements identified in the Requirements phase.

The purpose of the detailed design phase is to:

- Transform the requirements and conceptual design into detail design models of the new system

- Evolve a robust architecture for the system
- Adapt the design to match the implementation environment, designing it for performance

The detailed design activities are centered on the system's architecture requirements. The production and validation of this architecture is the focus of early design iterations. Architecture is represented by a number of architectural models. These models capture the major structural design decisions. In essence, architectural models are abstractions or simplifications of the entire design, in which important characteristics are made more visible by leaving details aside. The architecture is an important vehicle not only for developing a good design model, but also for increasing the quality of any model built during system development.

Saber will thoroughly review the technical requirements documentation and identify any adjustments or corrections needed. The architecture activities will result in a system architecture model, class diagrams, and some high-level sequence diagrams.

The system architecture model provides a high-level view of the system, its subsystems, and the necessary interfaces that will satisfy the requirements. The class diagrams serve as an abstraction of the source code; that is, the design model acts as a blueprint of how the source code is structured and written.

The design model consists of design classes structured into design packages and design subsystems with well-defined interfaces, representing what will become components in the implementation. It also contains descriptions of how objects of these design classes collaborate to perform a function.

4.3.7 Data Conversion

Conversion represents one of the most critical tasks associated with any large scale development and implementation effort. Success of the project is not measured solely by the completeness and accuracy of the newly developed application software. Saber has considerable experience migrating data from local voter registration systems to our Electus product. Saber converted data for over 400 counties in its six Electus states internally without using a third party to perform the migration for us (though partners and other parties did assist in data extraction and in assisting counties in helping cleanse their data). The process outlined below is the result of industry standards complimented by lessons learned. Two unalterable requirements for a successful migration include:

- **A successful migration is heavily dependent upon cooperation and involvement of local jurisdictions.** From complete and timely delivery of source data sets, to final verification of the migrated data, we engage the local jurisdiction to ensure our understanding of the data we're working with. Open lines of communication between the migration team and the people who know the data best are critical to ensuring reliability and confidence in the migration process. It has been our experience that the satisfaction of local jurisdictions is directly related to their level of involvement.
- **All migration processes must be repeatable and fully documented.** This not only relates to the iterative nature of the migration process, but on-going support as well. While we make every effort to ensure that the migration is complete and reliable, situations have arisen in the past that required re-migration of certain data sets. All of our processes are retained in their final state to provide documentation of the process as well as accommodate future requirements. Should a future need arise for re-migration, necessary adjustments can be made to the existing process to ensure that no new issues are introduced.

Our approach to migration is straightforward: automate the migration of existing legacy data to the extent possible, carefully analyze resulting data sets, perform testing, review the results, resolve issues, and continue these steps until done. The Saber team has senior team leaders in data migration with in-depth experience successfully performing migration projects of a size and complexity similar to the WyoReg project.

Following are the major steps utilized in our methodology:

1. **Planning and Analysis.** Early in each implementation phase, Saber begins planning for migration of the data necessary to support that phase and performs the analysis that feeds the migration design.
2. **Design.** In this step, the migration design is developed. The source-to-target mapping is performed, required data transformation rules are developed, and migration sequencing and reconciliations are finalized.
3. **Extract Data.** In this step, data is extracted from the existing legacy applications and control reports are generated to facilitate the post-conversion reconciliation process. The extract step is part of an iterative process in which the extract scripts are modified as data discrepancies and errors are analyzed and reconciled.
4. **Stage Data.** In this step, data extracted from the source systems is loaded into a staging area. Control reports are generated and compared to the statistics generated from the extraction process, and any discrepancies are noted and resolved. This data set will be retained as a static, re-usable reference to the source systems, and will not be modified in any manner. The source data is thoroughly analyzed in this step to determine suitability for inclusion in the new system, identify anomalies, necessary transformations and cleansing needs, and compared to companion data sets from other systems to identify and resolve conflicts and duplication.
5. **Load Data to Repository.** As data is moved from the staging area to the migration repository, transformation rules are applied, duplicate information is eliminated, and known issues are resolved through migration scripts and various functions and features available through Oracle Warehouse Builder and specialized utilities. Resulting record counts and contents are compared to the staged data, and exception reports are generated based on any discrepancies discovered.
6. **Analyze Data.** Upon completion of the load and transformation to the migration repository, data is again analyzed to verify that the load process has executed correctly and that the transformation rules were applied successfully. Final migration reports are generated during this step for validation, comparison, and reconciliation purposes.
7. **Reconcile Data.** Data reconciliation takes place immediately after the load, transformation, and analysis steps. The target data is compared against the source data using both manual and automated processing to identify data reconciliation errors and resolve these errors through subsequent extracts and loads. Once any necessary corrections or modifications are made, the data (or a subset) will be moved to the testing environment.
8. **Approve Data.** Once the data has been migrated to satisfy the exit criteria as defined in the Detailed Migration Plan for the conversion scope, the local jurisdiction will approve the data as ready for production operations. Granted this approval, the conversion team will load the data into the production environment.

Figure 3 describes Saber's data migration process and the roles that the various parties will play.

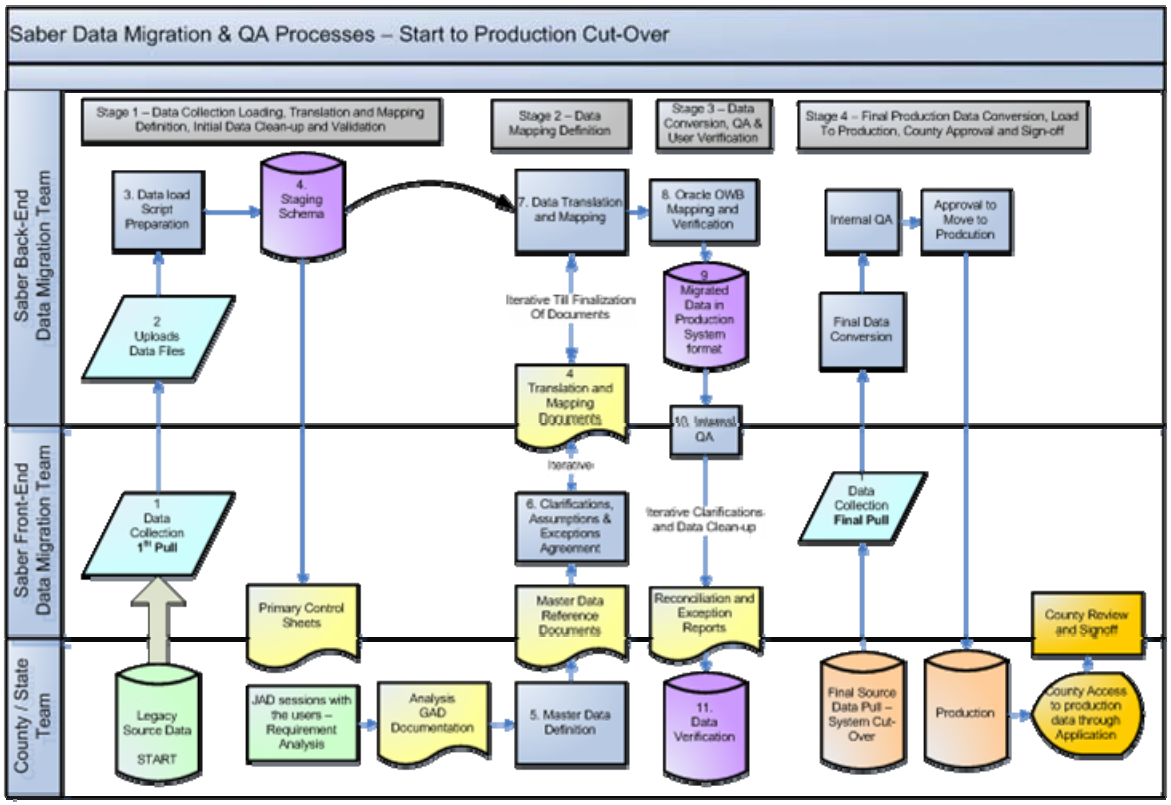

Figure 3. Data Migration and QA Process

The objective of the data conversion plan is to plan for the movement of data to system in a well-planned, organized fashion. The conversion plan will address at a minimum, the following:

- **Conversion Strategy –** The strategy section of the data conversion plan will discuss the conversion philosophy and roll out strategy. The conversion rollout will be closely tied to the implementation and training plans
- **Work Plans and Resources –** The work plan will be enhanced with a lower level of detail to identify all data to be converted, the time frame and meetings necessary for data mapping from the old system to the new system, and conversion testing/validation exercises. In addition, the identification and participation of the necessary client resources will be added.
- **Data Mapping –** Data mapping requires extensive analysis to be performed given the client's current use of multiple systems on varied database platforms and programming languages. Decisions will be made based on user input, business requirements, as well as the use and treatment of the data in the new system. A data-mapping tool will be used to provide the following information in an accurate and consolidated fashion:
  - From where – identifies fields to be converted from the paper forms
  - To where – identifies equivalent fields on the new system
  - Apply field logic – defines any manual conversion logic (e.g., calculations, dependencies, interpretations, defaults values, conversion rules and edits) that needs to be applied to the field to make it "new system ready"
- **Automated Data Conversion –** Saber recognizes that automatic conversion will be necessary and that there are multiple systems and subsystems currently in use. Saber will review the existing data sources and plan the automated conversion process so that manual input is minimized.
- **Manual Data Conversion –** Saber will assist the state in determining the most efficient way to collect, verify, and enter the manual information. If necessary, we will develop manual entry screens to facilitate the manual data entry from the hardcopy sources.

4.3.8 Software Development and Customization

Using the conceptual and detail design artifacts (artifacts such as the Logical Data Model (LDM), object model, high-level sequence diagrams, design class model, and the physical data model), our developers will develop programs in the form of classes and methods. They will use the requirement specifications as the basis to incorporate the business rules and the functionalities, and will develop the unit test plan using the unit test template.

Our developers will code programs based upon specifications. In this process, they create and modify program codes until the application compiles successfully. They may use stubs for the interfaces that are yet to be developed. Our developers will conduct code reviews with members of the technical/system development and quality assurance team. This review helps ensure efficient program processing and conformance to development and programming standards.

The developers will unit-test the programs per the unit test plans. Once the use case or a group of the use cases that form a logical group is developed, it will undergo integration and system testing per the test plans.

This development will be iterative while all the functions within all the subsystems/modules are developed. Once all the subsystems are developed, our testing team will perform an integration, system, and technical testing of the whole system. Once it is deemed that the system is ready for UAT, it will be migrated to our client's target platform for user acceptance testing.

The purpose of development is:

- Build the application per the functional and technical requirements
- Perform unit, integration, system, technical and user acceptance testing per the test management plan
- Develop conversion programs
- Define the organization of the code; in terms of develop subsystems organized in layers.
- Develop classes and objects in terms of components (source files, binaries, executables, and others).
- Test the developed components as units.
- Integrate the results produced by individual implementers (or teams), into an executable system.

During this phase, Saber will review the capacity evaluation plan to ensure the system can handle the technical requirements and make necessary changes.

Project Implementation Tools

The following tools have been used in our HAVA projects implemented in Oregon, Iowa, Mississippi, Maryland, Montana, and Missouri and they will be used for the implementation of the WyoReg system.

Tools	Use
Project Management	
MS Project, Excel, MS Word, Adobe/Adobe Acrobat, Power Point, Go to Meeting (conferences and training)	• Creation of project documentation • Communications and presentations • Web meetings and web training sessions • Project schedules and budget management
Technical Communications	
Visio, Go to My PC (remote support), Citrix Shadowing (remote support), FTP secure sites (data transfers, secure document transfers)	• Creation of technical documents (ERD/FHD, network and system architecture diagrams) • Remote support of Electus desktop users • Secure transmission of data sets and controlled documents
Requirements Gathering & Tracking	
Dynamic Systems Development Methodology (DSDM) uses a technique called Joint Application Development (JAD) sessions for Rapid Application Development (RAD). The results of these sessions are documented in a document known as the Functional Requirements Specification (FRS).	• Focuses on active user participation to design the system according to their needs • Real time RAD of screens and system functions maintained in the development environment • Real time system requirements documentation

Tools	Use
Design Modeling (Security, Performance & Function)	
ANTS (Red Gate v2.5) http://www.red-gate.com/products/ants_profiler/index.htm	• Optimize application performance by identifying performance bottlenecks • Tunes the .NET application • Profiles memory to analyze how the system uses memory
Software Construction (Coding, Testing, Debugging)	
Testing: • QTP (Mercury Quick Test Pro v 8.2) Coding & Debugging: • Microsoft Visual Studio 6.0 Professional Edition • Microsoft .NET Framework 1.1 • Microsoft .NET Enterprise Architect 2003 • ImageBASIC - For scanning images • Vision Shape (Server module for image scanning) • Data Dynamics ActiveReports for .NET	• For Automating Testing of Vb.net application • For Application Development • For Image Scanning • For Report Creation
Testing (Validation, System, Security & Performance)	
HP OpenView Indicative Suite Oracle Spotlight	• Performance Monitoring at both database and system levels • System back up and restore • Intrusion Detection • Replication and synchronization across multiple data centers
Issue Tracking (Ticketing, Changes, etc.)	
Atlassian JIRA.	• Manage bugs, features, tasks, and improvements • Track components and versions of software • Provide a customizable dashboard of views and workflows in a task driven interface that is easy to understand • Full text searching and filtering • Customize project roadmaps and flows for managers, developers, and testers

Tools	Use
Configuration Management	
Win CVS (v1.2 & v1.3)	• Records the changes made to the source code and documents during the entire life cycle • Assigns software build numbers for various releases that will be made through the SDLC
Software Deployment	
Central system updates/new software releases are managed by Saber system administrators who follow the System Administration protocols and any Warranty or Service Level Agreements in place.	• Electus message module alerts users of pending system upgrades • SPIRIT message alerts also inform users of pending system upgrades • System administration manuals and Service Level Agreements specify conditions for system upgrades
Library Management	
Microsoft Active Directory for secured network directories and folders established by Saber system administrator	• Document version control • Document access controls • Document sharing within project team

4.3.9 System Implementation/Installation

Saber will initiate the Implementation/Installation Plan with the client's project team. For a successful implementation, a strategic plan must be in place that identifies the game plan clearly. Often during the implementation stage, several players are involved and they all must work in tandem to make the implementation a success.

Saber will work with our clients to develop the Implementation/Installation Plan. The plan will describe the processes, schedules, hardware and software installation and site preparations. The plan will address:

- Objectives and approach for components requiring installation, with particular emphasis on utilization of the WAN, Intranet, Extranet, and Internet
- Software installation relating to system issues
- Site preparation, addressing site specific requirements and plans
- Installation schedule in coordination with plans for conversion and training
- Recommendations concerning third-party software needs and timing of purchase (if applicable)

Saber, subsequent to analysis, will provide a recommendation to the client and will construct an Implementation Plan, inclusive of tasks schedule, as the base from which to drive the deployment effort.

4.3.10 Testing

Saber's robust experience in the responsibilities associated with executing high quality testing has been demonstrated in numerous client engagements. Saber is very experienced in functional and regression testing best practices and provides the testing foundation from which to develop the business specific logic that is applicable to the system.

These are the high level test activities:

- Development of a quality test plan and testing schedule
- Integration and system testing
- Facilitation/coordination of the staff testing effort
- Provide support and software corrections during user system testing
- Submitting a written document summarizing test results.

Test Planning activity starts at a very early stage of the project, actually in the Project Planning phase. Key features of our testing methodology include:

- **Formal Test Plan document:** Understanding the goals of the application to be tested is critical to the success of any testing effort and this understanding will be obtained through our Requirements Management process that will provide final traceability into the complete requirements of the applications. Based on this final functional requirements matrix we will develop a formal Test Plan document.
- **Test Cases:** Subdivide the tests into test cases. It is impossible to automate all aspects of the test plan therefore; automated testing should be focused around the complex and critical business processes that map to functionality. This is usually 60% – 80% of the total test cases and the other test cases will be conducted manually.
- **Ensure that tests use real data:** Saber's testing methodology ensures that all functional and regression testing is done using real data. Both manual and automated features are used to populate a simulation of real data into the testing database. However, data are scrambled to make sure that sensitive information like SSN or DL is not used in this testing.
- **Add verifications to your tests**: It is important that any testing plan has the ability to provide test verification. This includes verifications of the front-end of the application, the middle tier, and the back-end database and provides us information regarding a test, its status, and its reasons for failure at a glance.

Saber bases its testing strategy and philosophy on the following five principles.

Validation Principle – The overriding objective of testing at all stages is to check that a system is fit for business purpose. The correctness of test results is judged at all stages of development against whether the system performs in a way that meets the business needs, whether or not statements of requirement are accurately represented in baseline documents.

Error-Centric Testing Principle – The objective of designing and running a test is to find an error. Testing can never prove that a computer system works: it can only build up a feeling of confidence. Confidence is derived from finding errors, which are then fixed.

Testing Throughout the Life-Cycle Principle – Testing must be performed on all products at all stages of the implementation process. Software products and associated design and user documents emerge throughout the development process. Therefore testing must be planned as an integral part of the iterative life cycle.

Independent Testing Principle – A deliverable should be tested by someone other than its creator. Independent testing is more effective than testing performed by the author of a deliverable. The active and constant involvement of users in the project ensures that an independent perspective can be applied.

Repeatable Testing Principle – Tests must be repeatable. To make a test repeatable, it must be documented.

Saber utilizes a full-scale Quality Control strategy to ensure a high quality implementation of the system. Saber's test strategy includes the following comprehensive tests:

1. **Module Testing:** Module testing is performed on each individual software module that comprises the system. This test is used to find limitations in every individual/independent features of every module in the system.
2. **Multi-Module Testing:** Multi-model testing includes verification of interactions between modules and verification of business functionality. Saber will be responsible for performing multi-module tests in collaboration with State and County staff.
3. **Data Migration and Conversion Testing:** Testing to ensure that all data elements and historical data are converted from an old system format to the new system format. This is one of the most critical areas of the whole system. Saber will develop the migration procedures in collaboration with the State and County staff to identify the algorithms for data merging. Saber will need to work with county staff to ensure the accuracy of the tests and the merged data records.
4. **Load Testing:** Load testing is done to ensure that the application performs to customer expectations under peak load conditions. Saber will used load-testing tools to simulate the maximum or peak load usage of the system and ensure that it continues to perform in accordance to the response time requirements.
5. **System Security Testing:** This testing is done to ensure that the application, network, and operating systems of the application are functional.
6. **Network Testing:** Once the network architecture is approved and installed, Saber's network engineers will work with the State and County designated officials to test the various network components for functionality and meeting the response time and security requirements of the System.
7. **System Integration Testing:** The purpose of integration testing is to ensure that design objectives are met and ensures that the software, as a complete entity, complies with operational requirements. Integration Test is performed on this project to make sure all contained modules can communicate with each other properly & all software features that require integration within modules are functioning as expected.
8. **Regression Testing:** Integrated into the process of iterative design/build prototyping, our regression testing methodology ensures that new releases of the software do not introduce new bugs or eliminate functionality present in previous releases. Regression testing is a primary component of module and multi-module testing and is a consideration in the other eight tests described above.

4.3.11 Pilot System

During this phase, Saber will support a limited rollout to selected counties through a production pilot of the application. To begin the process, Saber will provide the necessary documentation and training to the target site. At this time, Saber will ensure the environment's readiness and complete the final data conversions. This includes implementation of appropriate hardware and software, as well as ensuring full network connectivity for the pilot site. The project team monitors the production pilot, ensures support for pilot users, documents issues, and performs an analysis of the pilot implementation. Upon approval, recommendations from the pilot analysis are implemented in time to be tested and rolled out in the full production implementation.

Based on the experience gained during this pilot production phase, Saber will refine and complete the development of the following plans:

- The hardware and software deployment and installation plan
- Training and end user documentation plan

Saber's proposed methodology includes multiple stages of testing. At the completion of system testing, user acceptance testing activities will occur using the same hardware and software configurations as the production environment in the test environment. This testing will involve end-to-end functional testing of the application. Saber will list in details all the tasks necessary for a successful implementation in pilot. This implementation plan will be developed with inputs from the State and will be one of the deliverables.

While developing the implementation plan, Saber will work with our client to determine the pilot office (assuming that the client has not already selected an office) suitable for the pilot implementation. Saber recommends that this pilot site be a quiet office having all necessary infrastructure (staff who are familiar with the Internet and Windows, understand the business functions, and have good hardware and telecom infrastructure, etc.) to support new system.

4.3.12 Production Setup

Setup of the supporting infrastructure components will occur prior to deployment of the secondary hosting site. The necessary components and activities needed for the central site include:

- Deploying all relevant components in production
- Configuring security and system setup options
- Documenting all operations procedures and setup parameters
- Testing of final installation
- Adjusting the configuration as needed

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5. PROJECT SCHEDULE

5.1 Solution Considerations

Saber will undertake the customization and implementation of the WyoReg application according to the project schedule proposed below. The system will be customized as per the requirements listed as enhanced in the JAD sessions, prioritized with the standards /steering committee, and mutually agreed to by the State and Saber. The implemented system will meet all necessary requirements for Wyoming Elections laws prior to December 15, 2007. Saber will also make an effort to include at least 95% of business process changes as desired by the State of Wyoming by this period. Any requirements that are identified as part of the baseline scope that are not doable by this date will be completed as part of the first year of support.

Any items beyond base requirements will be addressed as part of subsequent year's maintenance and Platinum Support, if within the allowable hours. Work beyond the scope of those hours would require a separate contract.

This section details the high-level view of the implementation schedule across various tracks that will be followed to achieve the proposed implementation of the WyoReg system in this phase of the project.

5.2 WyoReg Deliverables and Milestones

5.2.1 Track 1: Project Management

The goal of the Project Management track is to define all the project plans and have them approved by the State. This way, the State will always be informed of the plans of the various other tracks and will have a way of measuring the performance as planned. The other purpose of the Project Management track is to provide the contract administration functions and to provide constant reporting.

Task	Completion
1. **Develop Detailed Project Plan:** A guideline to the successful completion of the project. Will include all sub plans like, software development plan, communication plan, risks and assumptions, change management protocols, status reporting, and lessons learned protocols.	4/27/2007
2. **Define UAT and Develop Testing Plans:** The various testing plans including software, hardware and testing. The plan will define the User Acceptance Criteria for the readiness of the application for pilot and the final acceptance of the application.	5/11/2007
3. **Develop User Training Plan:** A detailed plan for the types, content, and schedule of the counties and the State staff training.	5/11/2007
4. **Develop System Implementation Plan:** A comprehensive plan describing the schedule, checklist for readiness and a description of the cut-off and rolling the counties into the new system.	5/11/2007
5. **Select Pilot Counties:** Define the criteria for selection of pilot counties including the final and approved list of participating counties.	4/13/2007
6. **Develop Hardware Plan.** A completed and approved hardware plan including the selection of the data center, final cost, final list of components and final approved required licenses.	4/13/2007
7. **Develop Security Plan.** A detailed and final approved plan describing the security architecture of the system. The plan will also include the security features and measures of the application.	4/27/2007
8. **Develop Disaster Recovery Plan.** A detailed and final approved plan describing the approach to disaster recovery including recommendations to the counties.	5/18/2007
9. **Develop Interfacing Plans.** Describing the technology and protocols for communicating with all external agencies.	5/08/2007
10. **Develop Data Migration Plans.** A detailed plan to the methodology, extraction, loading and verification of the data and images from the various counties to the centralized system. The plan will include the phases of pilot and final rollout.	5/08/2007
11. **Develop Program Transition Plan.** Develop the plans to transition from project to program including the development of an SLA for ongoing maintenance and support.	5/18/2007

Please see attached project schedule: WYOREG Project Plan 031707.mpp

Figure 4. Project Plan for Project Management Track

5.2.2 Track 2: Software Customization

The goal of the Software Customization track is to collect and approve the final set of user requirements and customize the software accordingly; this includes development of interfaces to external agencies as required by WyoReg. The plan also includes the prototyping, testing, and configuration management aspects of the software.

Task	Completion
1. **Conduct JAD Sessions.** Schedule and conduct the needed JAD sessions with the State and subject matter experts from the counties. The purpose of the task is to verify requirements and analyze the gaps in the existing software.	6/08/2007
2. **Finalize Requirements.** The result of the JAD session is a Functional Requirements Specifications document. Saber will submit the document for the State's approval.	6/08/2007
3. **Customize the Software.** An iterative prototyping cycle of customizing the software and involving key users to verify and incrementally approve the changes.	7/13/2007
4. **Build Interfaces.** Develop interfaces to identified agencies.	7/13/2007
5. **Develop Test Scripts.** A complete set of test scenarios and scripts to test the application including changes and customization.	6/29/2007
6. **Internal Software Testing.** A detailed internal testing of the software by Saber QA manager and the supporting team to ensure successful testing by the users.	6/29/2007
7. **Train Testing Users.** The user group identified to perform testing will need to be trained on the application just before the testing starts.	7/20/2007
8. **Perform User Testing.** Users will apply the test scripts to test the software and the customization to verify readiness for deploying the software to pilot.	7/27/2007
9. Conduct Mock Election. Users will conduct a mock election with activities that are undertaken in the election, to assess the readiness of the application for a mock election.	7/27/2007
10. **Accommodate Feedback.** The development team applies the needed changes and bug fixes based on the feedback from the user testing.	8/10/2007
11. **Update User Documentation**. Based on the customization of the software.	8/17/2007

Please see attached project schedule: WYOREG Project Plan 031707.mpp

Figure 5. Project Plan for Software Customization Track

5.2.3 Track 3: Data Migration

The goal of the Data Migration track is to extract and migrate data and images from the various systems used by the counties into the new system. The track includes the tasks of mapping the data and coordinating unified sets of look up tables and verifying the accuracy and correctness of the migrated data and images. The Data Migration track also includes establishing interfaces to external agencies. Saber will migrate all current and historical election data that counties have in electronic format. Saber will not be responsible for migrating any paper documents.

Task	Completion
1. **Collect Data from Pilot Counties for UAT**. Collecting data and images from the identified pilot counties.	4/06/2007
2. **Develop Data Mapping & Translation**. Analyze data and build code translation and mapping documents.	4/20/2007
3. **Approve Data Mapping & Translation**. Work with the counties to review and approved the data mapping and translation documents.	5/04/2007
4. **Perform Data Migration For Pilot Counties**. Develop the procedures to migration the data and images into the new system.	6/8/2007
5. **Verify Pilot Data Migration**. An iterative process to involve the pilot counties in verifying the correctness of the migrated data and images.	7/6/2007
6. **Re-collect Data from Pilot Counties for Production**. Collecting data and images from the identified pilot counties for final production rollout.	8/10/2007
7. **Perform Production Data Migration For Pilot Counties**. Execute the tested and approved procedures to migrate the pilot counties the new system.	8/17/2007
8. **Collect Data from Remaining Counties**. Collecting data and images from the identified pilot counties.	5/18/2007
9. **Develop Data Mapping & Translation for Remaining counties**. Analyze data and build code translation and mapping documents.	5/25/2007
10. **Perform Data Migration For Remaining Counties**. Develop the procedures to migration the data and images into the new system.	7/6/2007
11. **Verify Data Migration For Remaining Counties**. Develop the procedures to migration the data and images into the new system.	7/13/2007
12. **Statewide Migration**. Once the pilot group is completed and successful, statewide data migration starts.	11/09/2007

Please see attached project schedule: WYOREG Project Plan 031707.mpp

Figure 6. Project Plan for Data Migration Track

5.2.4 Track 4: Infrastructure

The goal of the Infrastructure track is to finalize the plan for the hardware and security equipment and installation into the selected location of the data center. The track includes the procurement, installation and testing of the hardware and security equipment.

Task	Completion
1. **Select Location**. A final decision about the location of the data center. This task includes ensuring the suitability of the selected site to host the approved hardware and security equipment as per the relative plans.	4/11/2007
2. **Finalize Hardware**. A completed and approved hardware and security equipment list including costs and delivery dates as per the hardware and security plans.	4/20/2007
3. **Finalize Security**. A completed and approved hardware and security equipment list including costs and delivery dates as per the hardware and security plans.	4/27/2007
4. **Order Hardware**. Submit purchase orders for all approved hardware and security equipment.	4/20/2007
5. **Hardware and Software Procurement**. Complete the procurement for the counties and the data center.	6/01/2007
6. **Install Counties Hardware**. Complete the installation and configuration of needed county hardware (scanner, printers, label printers, and computer (if needed)). This step will be coordinated with the statewide rollout plan. Saber will be responsibility to make sure the software is installed properly on both county and state hardware.	10/12/2007
7. **Data Center Installation**. Complete the installation and configuration of the data center. The task includes developing all needed documentation of the configuration of the equipment including the hardware itemized lists for configuration and inventory management purposes.	7/13/2007
8. **Data Centers Testing**. Conduct fail over, security and other approved testing as per the hardware-testing plan.	8/03/2007

Please see attached project schedule: WYOREG Project Plan 031707.mpp

Figure 7. Project Plan for Infrastructure Track

5.2.5 Track 5: Implementation

The goal of the Implementation track is to perform all the needed activities to check the counties readiness for joining the new system. This track includes county connectivity, hardware gap analysis, user training, and other related issues.

Task	Completion
1. **Survey County Hardware**. If needed, a detailed survey of each county's hardware requirements to be able to use the new system.	4/27/2007
2. **Prepare Pilot Counties**. Ensure readiness of pilot counties. Including connectivity and hardware.	8/03/2007
3. **Train Pilot Users**. Train pilot counties users in preparation for the system pilot implementation.	8/24/2007
4. **Support Pilot Implementation**. Provide the needed support to pilot counties during pilot implementation.	9/17/2007
5. **Prepare Statewide Counties**. Procure any needed hardware and connectivity in all the counties statewide. This step is coordinated with the statewide Rollout Plan.	10/12/2007
6. **Statewide Help Desk**. Saber will establish a help desk service to support the production rollout of the system.	8/10/2007
7. **Train Users**. Provide statewide training for all users in coordination with the statewide Rollout Plan.	11/09/2007
8. **Statewide Rollout**. Provide support for the statewide implementation in coordination with the statewide Rollout Plan.	11/16/2007

Please see attached project schedule: WYOREG Project Plan 031707.mpp

Figure 8. Project Plan for Implementation Track

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6. PROJECT ORGANIZATION AND KEY PERSONNEL

Several critical factors will ensure that WyoReg is successful: a skilled and experienced project team combined with the best project approach, tools, and methodology. Key personnel with the right blend of qualifications, knowledge of elections and experience are crucial to implementing WyoReg on time and on budget. Saber proposes a team of seasoned technical and functional experts with proven experience in delivering Electus on time and on budget. We believe that our proposed team will exceed the State's expectations and deliver a solution that meets each stakeholder's needs. Figure 9 provides an overview of the expertise that Saber will bring to WyoReg.

Based on our many successes, Saber has designed a team alignment that serves the project in the most efficient way possible. As shown in Figure 9, the project's overall team is divided into three groups:

- A dedicated onsite group of key personnel such as the Project Manager, Technical Lead, and Functional will be on site. The overall project manager is responsible for managing the day-to-day project activities. The project manager plans, controls and manages conflicting priorities within the business processes, organization, locations, data, technology, and applications. The project manager maintains the "triple constraint"—the scope, schedule, and budget.
- The second group is the group of line managers and team leads that provide the various technical services needed by the project. This group coordinates project activities between the onsite group and the teams carrying out the activities. This group will be available on site as needed.
- The third group is the group of technical resources that executes the various activates. Some of the teams of this group will be available on site for the duration of their assignment, like the data center building team and the deployment team.

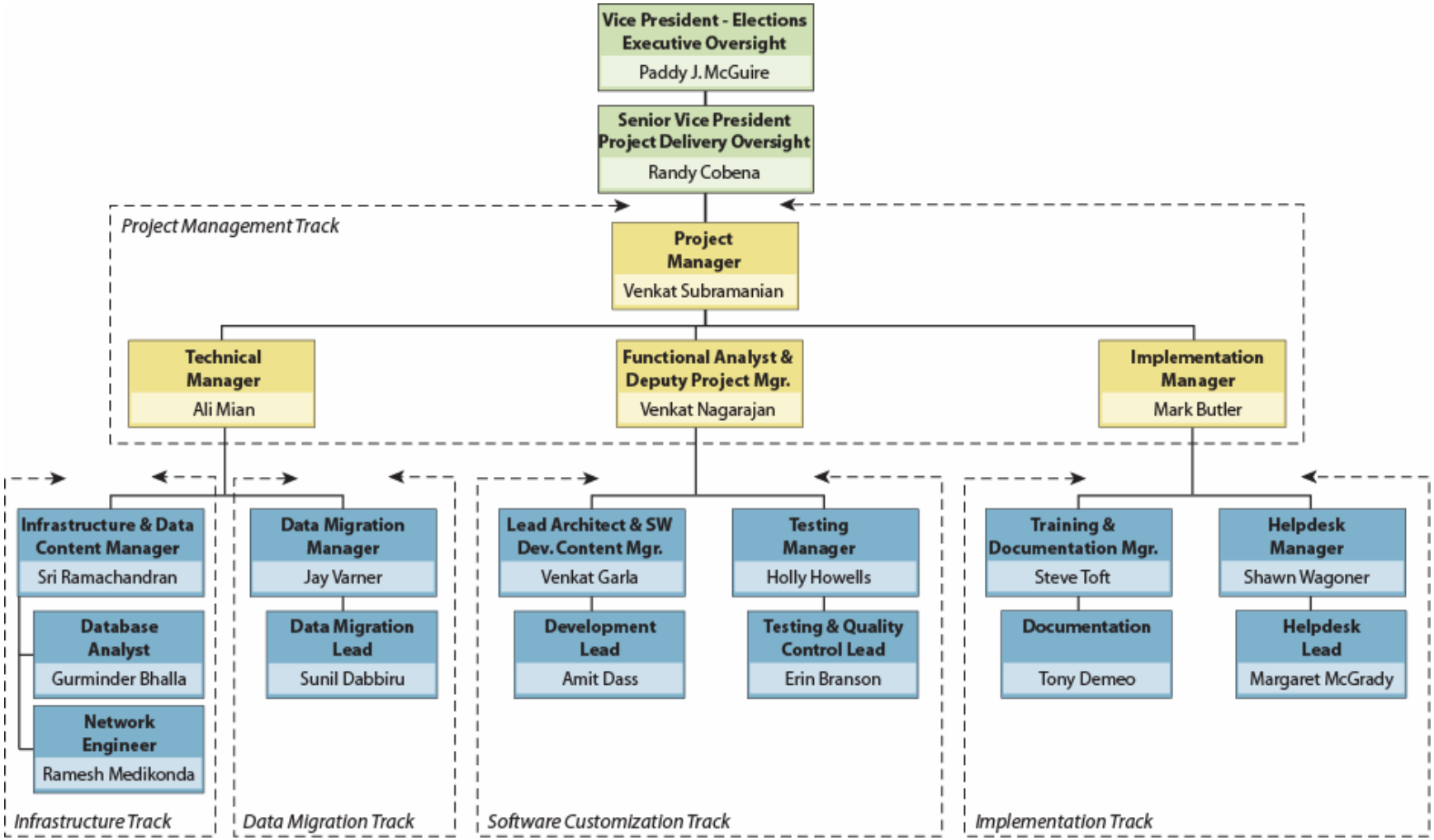

Figure 9. Proposed Project Organization

6.1 Saber's Team and Our Responsibilities

The project management team has extensive experience planning and managing large government projects, and each individual has specific experience managing statewide VRS implementation projects. Saber offers to the State a mature and experienced management group that will be crucial in steering the WyoReg project to completion and a successful outcome. The management team members are veterans with many years of experience planning, managing, and implementing systems similar to WyoReg.

6.1.1 Committed Executive Oversight

Paddy McGuire, Saber's Vice President of Elections, will be providing executive oversight to the project. In this role, he can commit Saber's resources to the success of this project and can resolve any contractual or project issues. He is personally vested in the success of this project and the reputation of the firm, based on the work done on this project. Mr. McGuire joined Saber in early 2007, after nearly twenty years in state and federal government. In this time, he served as Oregon's Deputy Secretary of State overseeing the Elections Division, Senior Policy Advisor at the Bonneville Power Administration, Director of the Office of Intergovernmental Affairs, Chief of Staff to the Deputy Secretary for the U.S. Department of the Interior, and Legislative Liaison and Chief of the Public Communication Section for the Alaska Department of Fish and Game. He is a graduate of Hamilton College in Clinton, New York and the Senior Executives in State and Local Government Program at the Kennedy School of Government at Harvard. At Saber, Mr. McGuire is the primary point of contact for our elections customers, working to ensure that our client partners are satisfied.

Randy Cobena is a Senior Vice President for Saber. Randy is responsible to ensure all of our elections projects are completed successfully; he has been involved with the evolution of the Electus product and Saber's elections subject matter expertise since inception. Mr. Cobena has provided technical and managerial oversight to a number of states' HAVA implementations, including Maryland, New York, Colorado, Mississippi, and Oregon. Randy's strong process and methodology background for large-scale technology deployment help Saber assure that all projects execute against proven structured methods for quality-focused rapid development of our platform solutions; he has also been instrumental in formulating the Enterprise PMO initiative, which serves as the custodian of methodology and project management practices.

6.1.2 The Project Management Team

Venkat Subramanian (Project Manager), Saber's Electus Product manager brings more than four years of project management experience in elections administration, information technology and product delivery. He has a proven track record of ensuring on-time delivery of software applications. As a product delivery manager he has successfully delivered Electus product for all of our states. Mr. Subramanian has also served as Saber's PM for the Oregon Centralized Voter Registration Project. He will be transitioning out of that role, and will continue to provide support for Colorado, in addition to managing the WyoReg project. His work with the State of Oregon includes the full range of project management services; including project administration and oversight, scope planning, risk management and mitigation, functional specification development, communications, and documentation. He serves as a liaison and is responsible for project communications, schedule and coordination, creation of weekly status reports, issue resolution, development of presentations for steering committee meetings, and management of the project document repository. His work on the project helped Oregon Secretary of State successfully implement a federally compliant statewide voter registration system. Additionally, Mr.

Subramanian contributions to the project include instituting a number of application interfaces with Maryland state agencies, including Department of Mental Health and Hygiene, Administrative Offices of the Courts, and the Motor Vehicle Administration.

Mr. Subramanian will be dedicated to the project and will have extensive communication with the committee, via standard weekly status reports and monthly steering committee meetings (in addition to regular email communication about day-to-day issues). All track leads will report up to Mr. Subramanian who bears overall responsibility for managing and execution of the WyoReg project. In the majority of the project operations, the PM will have the highest authority on the decision-making on the project. In certain cases, issues may be escalated to the project oversight executive. This will however be coordinated by the PM and will be transparent to the committee, unless needed and desired by the committee.

This proposal includes 80 percent of Mr. Subramanian's time. He is currently committed to other projects, including Colorado, but he will be physically located in Cheyenne during the project and we are confident that he is the best person to get this project completed on time and on budget.

Venkat Nagarajan, Deputy Project Manager and Functional Analyst. Mr. Nagarajan has over two years of functional and project management experience in implementation of Missouri Centralized Voter Registration (MCVR) system. This project involved development of solution to assist the State of Missouri in implementing HAVA compliant Statewide Centralized Voter Registration and Election Management System. This project involved development of a comprehensive solution which included the development of voter registration and election management system, the conversion of the county data to MCVR from another vendor system, adding system interfaces, and the development of support modules to integrate with the MCVR system. Mr. Nagarajan has been involved in workflow administration, functional analysis, issue analysis, prioritization and resolution and release management over the duration of the project. He has also been the primary point of contact for the coordination of various project activities.

Ali Mian, Technical Manager. Mr. Mian was involved in the successful implementation of Statewide Voter Registration and Election Management Systems for the states of Oregon, Mississippi, Iowa, Missouri, Montana, and Maryland. He was a liaison between the client and Saber team for data collections, data migration and data verification process. Mr. Mian was responsible for designing the process for data migration and coordinating with the infrastructure team on data center hardware procurement, installation and testing.

Mark Butler, Implementation Manager. Mr. Butler has over three years of experience in software implementation of Centralized Voter Registration system for Mississippi, Montana, and Oregon. Mr. Butler was a lead trainer and was involved in development of training material for the end users. His responsibility included product roll-out, training the counties with the new releases, issue level resolution and help with the county related hardware equipment. He has also been the liaison between the client counties and Saber's technical team for the coordinating the various software related implementation activities.

The following table provides a summary of the key personnel of our proposed team that demonstrates our team's proven success in delivering these solutions by denoting the number of states for which they have played the same or similar role.

Project Leadership & Management		
Team Member	**Role**	**Involvement**
Paddy J McGuire	**Vice President, Project Oversight.** Overall project success, escalation, issue resolution.	10%

	[Involved in delivery of two Electus states]	
Randy Cobena	**Senior Vice President, Delivery Oversight.** Responsible for overall project delivery with direct oversight on the six tracks including the Salem Development Center. [Involved in the delivery of two Electus States	20%
Venkat Subramanian	**Project Manager**, project day-to-day management and coordination. Functional Manager, Facilitate requirements gathering and analysis. [Involved in delivery of seven Electus states, has played the role of Product Manager for Electus]	80%
Venkat Nagarajan	**Deputy Project Manager & Functional Analyst.** Day to day project coordination, requirements analysis and development liaison, Agency Interface Coordination. [Involved in delivery of four Electus states]	100%
Ali Mian	**Technical Manager.** Responsible for front end data collection and verification activities, data center implementation [Involved in delivery of seven Electus states]	100%
Mark Butler	**Implementation Manager – Coordinate Training & other Implementation Activities** [Involved in delivery of three Electus states]	100%
Data Migration		
Jay Varner	**Data Migration Manager**, oversight on all data migration activities. [Involved in delivery of seven Electus states]	30%
Sunil Dabbiru	**Data Migration Lead** [Involved in delivery of seven Electus states]	100%
Architecture & Security		
Sri Ramachandran	**Infrastructure and Data Center Manager**, in charge of implementing thirteen data centers for Electus. [Involved in delivery of seven Electus states]	30%
Ramesh Medikonda	**Network Engineer** [Involved in delivery of three Electus states]	50%
Gurminder Bhalla	**Database Administrator** [Involved in delivery of three Electus states]	50%
Software Modifications & Interfaces		
Venkat Garla	**Software Development Manager**, in charge of software development & customization, configuration management, coordination and release management [Involved in delivery of six Electus states]	50%
Amit Dass	**Lead Elections Developer** [Involved in delivery of Elections modules for six Electus states]	100%
Holly Howells	**Testing Manager** [Involved in delivery of five Electus states]	30%
Erin Branson	**Functional Testing** [Involved in delivery of four Electus states]	100%

Steve Toft	**Training Manager**	30%
	[Involved in delivery of six Electus states]	
Tony Demeo	**Technical Writer**	50%
	[Involved in delivery of four Electus states]	
Shawn Wagoner	**Helpdesk Manager**	30%
	[Involved in delivery of six Electus states]	
Margaret Mcgrady	**Helpdesk Lead**	50%
	[Involved in delivery of four Electus states]	

6.2 Responsibilities of the State of Wyoming and its Counties

The State plays a critical role in the success of the project. The sponsor's visibility and commitment to the success of the project is imperative. Additionally, the State will need to assign a full-time project manager who will play a key role in the various project governance groups.

- **The Core Team.** The Core Team is comprised of a project management team from both the state and Saber that is involved in the day-to-day project management. This includes the Project Managers from both parties and any other full time staff. This team meets officially at least once a week for a status update, a discussion of the tasks completed that week, the tasks that are envisioned to be completed the following week, and a detailed evaluation of the project risks, their proposed mitigations, and any risk escalation procedures that may need to be followed. Any potential scope creep that is being evaluated by the team is first discussed here. If the scope change involves a budgetary or timeline change it will be recommended for discussion at the Steering Committee level; scope changes not involving a budgetary or timeline change will first be recommended to the Standards Committee.
- **The Steering Committee.** The Steering Committee encompasses senior executives who are responsible for project success. This includes the WyoReg project sponsor and project executive, the Core Team, the Saber project executive, and any external independent verification and validation consultant that may be providing Quality Assurance (QA) to the project. This team meets officially at least monthly to obtain a project status update, to discuss risks, to discuss the monthly QA report, and to evaluate any potential scope changes that affect budget or timeline.
- **The Standards Committee.** Saber recommends the establishment of a Standards Committee as early as possible in the project. The Standards Committee serves an essential function in ensuring on-time project implementation; in fact, without the Standards Committee or a similar body it would be difficult to complete this project either on-time or successfully.
  - As Wyoming moves from several different systems to a single system, the State may have a different vision as to what the requirements and features of the single system should be. It has been our experience on large projects with a wide variety of stakeholders that there are always incremental requirements that are found that somebody needs to quickly decide whether they are "in" or "out" of the system.
  - Additionally, the implementation of a new single system will necessitate several policy decisions that the Standards Committee must quickly make and communicate out to the counties.
  - Finally, the Standards Committee provides a decision mechanism that the different counties can accept, because the process is deliberate and understandable.

Without the Standards Committee, our experience shows that the counties may see decisions made as arbitrary and this can lead to a high level of dissatisfaction. We recommend that the Standards Committee include no more than twelve members. The members of this team should be a mix from the State and the counties. The Wyoming's Clerks Association has selected three County Clerks to represent all the counties in the state. These members will be making decisions on behalf of the counties. The Standards Committee, as individual members, and as a group should adopt the following principles to ensure an on time and successful implementation of this project:

- All members will have the ability and willingness to commit to meetings at least monthly for two to eight hours per session depending on issues and urgency
- All members will make decisions based on a "statewide" perspective
- All members will have the ability and willingness to reach group consensus and move forward at an accelerated pace, and support the decision even if they do not agree 100%, knowing that the State is the contracting party having HAVA responsibility.
- All members will participate fully by contributing to the discussion

In addition to county participation on the Standards Committee, all counties need to make their staff available for specific events in the project. Following are the counties related key activities:

- Participate in JAD session(s) if needed
- Pilot counties to make their staff available to test the software
- Participate in User Acceptance Testing
- Be available for Training
- Work with Saber to extract the county data once or twice
- Review the data migration mapping and translating documents
- Verify the accuracy and completeness of their migrated data

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7. TECHNICAL SOLUTION

7.1 System Architecture

Saber is proposing its validated, tested, and world-class Maximum Availability Architecture (MAA) for the implementation of the system. Users are connected to either site as directed by the load-balancing infrastructure. Our expertise and experience in building and deploying thirteen such datacenters to support statewide VRS provides us with the confidence needed to assure you that this system will support the standard requested user base of 200 users, and the peak user base of 300 users. We have significantly enhanced both the base footprint and the scalability of our infrastructure to handle the election-day load.

Considering the high availability needs of an application such as this we believe that for ensuring business continuity we cannot recommend a single site architecture in which access to the system can be brought down by the simple unavailability of power, telecommunications, or a simple network device in the infrastructure.

7.1.1 Maximum Availability Architecture (MAA)

As its name implies, the MAA is the most highly available architecture possible using today's commercial technologies and can essentially provide "four-nines" uptime (99.99% availability). MAA concepts have been developed, refined, and validated by the ECOstructure project, which is a consortium, made up of HP, Sun, EMC, F5, and Oracle. Additionally, MAA has been validated and proven in the Statewide Centralized Voter Registration environment because it was chosen by a number of states we implemented the system in. The architecture was also tested and validated in a "sandbox" test environment at Saber before it was proposed to any client.

Saber's proposed Maximum Availability Architecture (MAA) takes the guesswork out of designing such a complex environment. Our proposed architecture, based on industry best practices, is a straightforward, redundant, and robust architecture that prevents, detects, and recovers instantly from different outages as well as preventing or minimizing downtime for maintenance. MAA provides the following major benefits:

- MAA gives the ability to control the length of time to recover from an outage and the amount of acceptable data loss under disaster conditions thus allowing uptime and recovery time to be tailored to business requirements.
- MAA reduces the implementation costs for a highly available Oracle system by providing detailed configuration guidelines.
- MAA provides best practices and recovery steps to eliminate or minimize downtime that could occur because of scheduled and unscheduled outages such as human errors, system faults and crashes, maintenance, data failures, corruptions, and disasters.

The logical diagram and description of all components for the MAA solution for a single site (all the same products will be replicated at the other site) is shown in the figure below. You will find that every single component of this architecture is redundant so that it is not straightforward to bring even a single site "down"; in a catastrophic situation such as power or network connectivity outage to a site, users will failover to the other site which is in a different geographic location and may not be susceptible to the same failures that caused the failure at the "first" site.

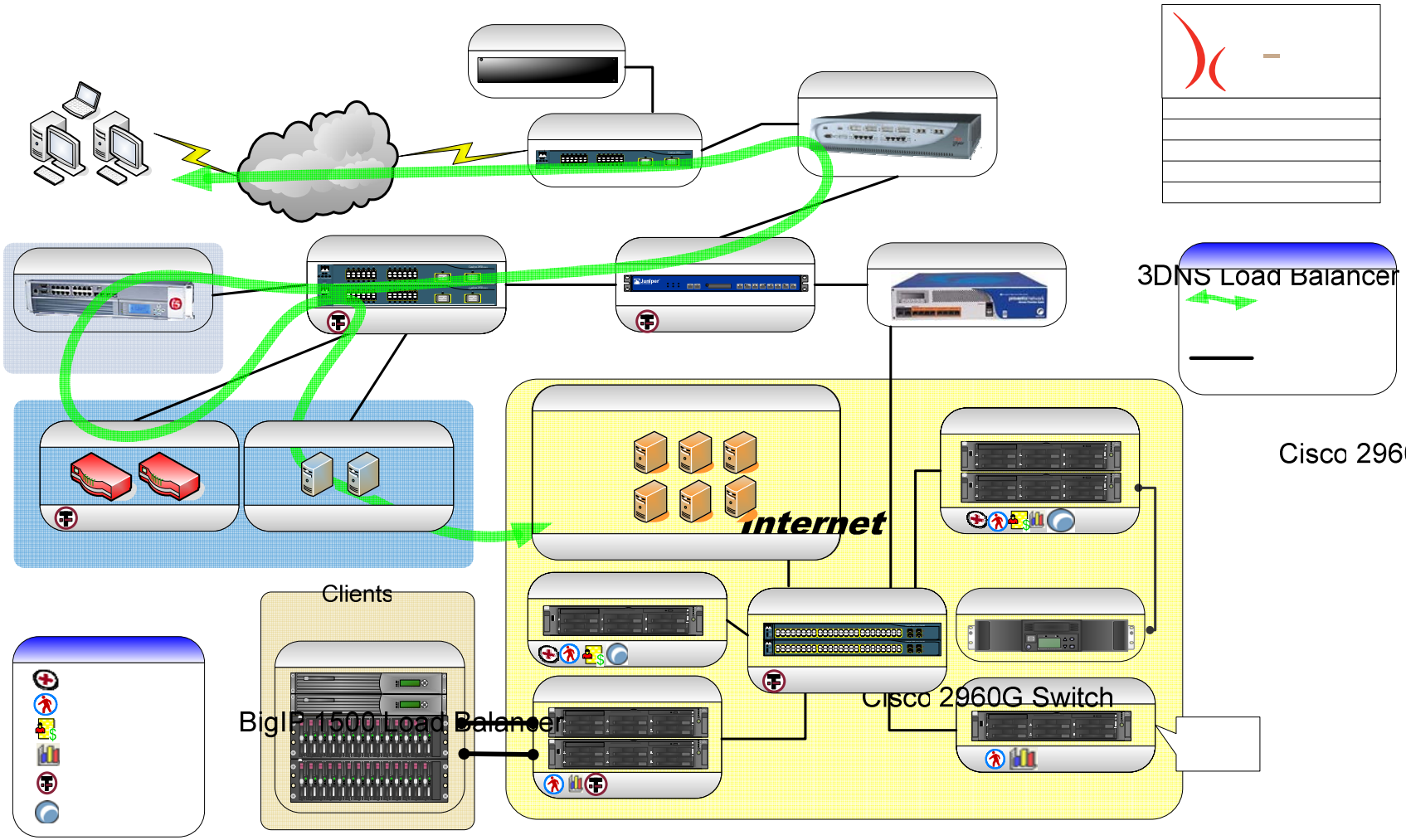


Figure 10. MAA Solution Logical Diagram

7.1.2 Key Architecture Components

Firewall - Netscreen provides VPN/Firewall security capabilities. This predictable, high performance component also provides strong denial-of-service (DoS) protection and enables network segmentation to minimize unauthorized roaming. Netscreen's secure dynamic VPNs provide a fault tolerant solution, combining the resiliency and efficiencies of route-based VPNs with the security and ease of use of policy-based firewalls.

BIG-IP Global Traffic Controller -Site Load Balancers - The 3DNS balance load between the sites and forward traffic to the appropriate sites in case of a site failure enabling global business continuity. 3DNS reduces management overhead by providing a holistic view into application and data center health from a single locale. This improves the efficiency, scalability and performance.

BIG-IP Local Traffic Controller - BIG-IP Local Load Balancers ensure that applications are always available simultaneously provides secure traffic management and optimize application performance. BIG IP is capable of providing network and application security by protecting from DoS and application attacks. This provides complete application fluency - enabling network-speed full payload inspection and programmable event-based traffic management to understand and act upon application flows.

Top Layer Intrusion Prevention System - The Top Layer IPS 5500 – 100 series is a network Intrusion Prevention Systems (IPS) that has been designed to deliver non-disruptive protection against risks and losses associated with cyber threats and network attacks. These Intrusion Prevention System appliances are easily deployed seamlessly in-line, and perform at the highest rates in the industry. These provide maximum protection for critical IT assets while allowing full access to legitimate users and applications.

Intrusion Detection System - ISS Proventia delivers preemptive protection by combining continuous vulnerability assessment and threat prevention with enterprise-wide information management and reporting capabilities. The ISS Proventia can be configured to be used both as detection or a prevention device. The Proventia device provides multi-faceted protection, automatic security content updates, virtual patch protection, spyware installation blocking/spyware communication blocking, quarantine capabilities, corporate network access control.

ISS RealSecure Server Sensor - RealSecure Server Sensor provides automated, real-time intrusion protection and detection by analyzing events, host logs, and inbound and outbound network activity on critical enterprise servers to block malicious activity from damaging critical assets. RealSecure Server Sensor applies built-in signatures and sophisticated protocol analysis with behavioral pattern sets and automated event correlation to prevent both known and unknown attacks.

Tripwire - The Tripwire's change auditing capabilities lower the risk of regulatory violations, disruptions, security breaches. Tripwire solutions detect and alert administrator to the changes in system files and device configurations that can threaten performance, undermine security, or, in the worse case, bring down the network.

Antivirus - The McAfee Anti Virus software enhances the network with comprehensive multi-tiered virus protection and shields the systems from exploits, viruses, worms, Trojan horses, and in-appropriate contents. It also eliminates the possibility of script vulnerabilities and provides silent updating. The McAfee Anti Virus can be configured to download updates from a central repository either on the internet or a repository configured internal to a site.

Cisco Router and Switches - The Cisco Switches and Routers included in the architecture are stackable standalone devices that provide wire-speed Fast Ethernet and Gigabit Ethernet connectivity. This switch offers two distinct sets of software features and a range of configurations to select the right combination for the network edge.

Web Interface Server - This server provides users with a web page front end for authentication and presentation of published application. This server provides the ability to publish and deliver applications without requiring any ICA (Independent Computing Architecture; a proprietary communication protocol developed by Citrix that is faster and more secure than HTTP or standard internet communications) client software.

Citrix Access Gateway - The Citrix Access Gateway is a universal SSL VPN appliance providing a secure, always-on, and single point-of-access to the application.

Metaframe Presentation Server - This server is where the published application is executed. This server accepts keystrokes/mouse clicks from clients to application, and delivers screen refreshes. Citrix Metaframe Presentation Servers allows for high performance, complete scalability and redundancy at each site.

The Metaframe Presentation server also acts as the Citrix Secure Ticketing Authority server. The Metaframe Presentation server is also responsible for generating and validating CSG authorization tickets, as well as storing real destination address during ticket generation and recovering that address during ticket validation

Data Guard - Technology which constantly maintains transitionally consistent copies of the production database. If the production database becomes unavailable because of a planned or an unplanned outage, Data Guard can switch any standby database to the production role, thus minimizing the downtime associated with the outage and enabling zero data loss.

Oracle Real Application Cluster - Oracle 10g RAC technology to cluster the databases at each site to provide high performance (through built-in cache technology), load balancing and instant failover (if one database server fails then all the load is moved to the second server)

Oracle Replication - Replication is the process of copying and maintaining database objects in multiple databases that make up a distributed database system. Changes made to the data onsite are captured and stored before being forwarded and applied at each of the remote locations. Even if one site becomes unavailable users can continue to query and update data from other sites.

7.1.3 Features of the Proposed MAA Architecture

Capacity - The network devices and servers used in our architecture have been carefully selected and would be tuned efficiently to handle from a medium load of about 175 users to a maximum user load of 300. Metrics such as CPU processing power and network interface throughput for the various devices have been pre-calculated from our prior experiences with the devices in order to make the final selection for each of the components in the architecture.

Scalability - The proposed architecture is designed to be capable of adapting to increased demands. The scalability of a system is not directly related to an increase in performance but in maintaining performance levels in the event of higher loads. Our platforms run off the two most scalable operating systems i.e. Windows 2003 Server and Red Hat Linux. The architecture proposed supports both scale up and scale out. Scaling up is the process of adding more resources to a single machine. Scaling up can involve increasing the RAM on a server or more processors. Scaling out is the process of adding servers to a server farm to distribute requests amongst multiple servers.

Expandability - The architecture is designed to accommodate expansion. In future additional memory, more number of or larger disk drives, nodes can be added in order to accommodate any increase in load or number of users.

Reliability - The architecture proposed proves to be reliable with reduced complexity and the attention given for reduction in single points of failures. The architecture suggested has been time tested and tweaked to perform under specific operational loads at the required throughput.

Availability - The proposed architecture is redundant across every layer of hardware and eliminates any single point of failure in the Architecture. There are at least two different servers at each site that perform all the tasks of providing uptime to the users including four Oracle Database Servers, twelve Citrix Metaframe Presentation Servers, three Citrix Secure Gateway Servers, and three Citrix Web Interface Servers. Each network component that provides availability is also redundant including all routers and switches.

Redundancy

- **Component Redundancy**. MAA is redundant across every critical layer of hardware and eliminates any single point of failure of those components in the Architecture. There are at least two different servers at each site that perform all the tasks of providing uptime to the users including two Oracle Database Servers, four Citrix Metaframe Presentation Servers, two Citrix Access Gateway Servers, and two Citrix Web Interface Servers. Network appliances are configured with high-availability (99.99%) features.
- **Site Redundancy**. Even if multiple components at one site were to fail or sites were to fail due to a power or telecommunications failure, we continue to provide uptime to end users. Users connected to the failed site will lose their sessions but will be able to quickly reconnect (using the Load Balancing hardware and software) to the failover site. This means that both sites would have to sustain catastrophic failure in order for the users not to have access to the application.
- **Last Line of Defense**: Oracle DataGuard. We are proposing the use of Oracle DataGuard that provides constant, continuous backup of the data and can switch key users (not all users) over to this "last line of defense" backup database in case of failure of both sites (which, in itself, is very unlikely).

Recoverability - We have redundant components built in through the architecture. If a component should fail, the users would still be able access the application without any interruption, and if through troubleshooting, we determine that the failure was caused by a software issue the device can be put back into operation. In the event of hardware failure, the component can be easily replaced and reconfigured using backups. Even if multiple components at one site were to fail or a site was to fail, the users can be rerouted to the surviving site, in the meantime the maintenance work can be performed at the failed site.

Administration - All the networking devices and the systems will be administered and necessary updates concerning security, performance, and firmware will be applied to the respective devices. The administration of the all network devices will be done from Management server in our architecture. Oracle and other third party software will be administered on a daily basis and necessary patches will be applied to fix bugs, improve performance and to enhance the security.

Management - Our architecture is comprised of a central server at each site that we have defined as our Management Server (MS). The Management Server is configured to monitor and configure devices such as the load balancers, firewalls, switches, routers and intrusion prevention devices. The Management server is also responsible for distributing anti-virus updates after

downloading it from the internet. The MS servers are equipped with WSUS (MS Windows Server update services) which enable us deploy the latest MS product updates to the other windows servers.

7.2 Security

Data Center Security - The security of the proposed network is safeguarded with a robust array of security technologies and devices such as the NetScreen stateful inspection firewall, NSS Certified ISS Proventia Intrusion Prevention System (Host and Network based) and Top Layer Intrusion Prevention device. The network traffic is also segregated into different VLANs for the different zones (Trust, Untrust, and DMZ) in the architecture. All the system components are protected from various internet threats by ISS RealSecure systems sensors and Antivirus software.

Client Security - Saber ensures client security using encryption. All communications take place using SSL (Secure Sockets Layer provided by VeriSign). The session is further encrypted by Citrix using the ICA (Independent Architecture) protocol. The workstations and servers connected to the system must be running a host-based anti-virus client. Anti-virus is critical in preventing the infection and spread of damaging viruses, worms, and spy ware. We expect this to be a policy enforced at the State and/or County level.

Electus Roles-Based Application Security - System security is of utmost importance in the Electus system. The design of the system security ensures the application of the most advanced best practices to protect the data and access to the application while allowing the State and the County the highest practical levels of flexibility in managing their users' accounts and access rights. The security of the Electus system is role-based. Each role is composed of any number of privileges. Once created, each role can be assigned to any number of users. Examples of roles are County Clerk, Election Worker, Administrator, etc. Examples of privileges include ability to save a voter record, ability to view confidential information, ability to create an election, etc.

Network Load Balance and Cluster Support - The architecture consists of global and local load balancers. The fail-over load balancing between sites is taken care of by the BIG-IP global traffic manager. It will automatically detect the failure of a site and will redirect new user connections to the failover site. The local load balancing within each site is taken care of by the BIG-IP local traffic controllers. The BIG-IP global and local traffic controllers provide with complete health monitoring of devices/sites, application-centric monitoring, and superior load balancing functionalities.

Bandwidth Requirements - According to our daily observations and monitoring we see a per user bandwidth consumption on Citrix at an average of 40Kbps (Kilo Bits per Second).

1 User	→	40Kbps
400 Users	→	16000kbpss = ~16 Mbps

We would require a 20 Mbps connection at each of the sites. After having added line and transmission overhead, we recommend installing a dedicated bandwidth of 20-25 Mbps/ site (leaving room for network bursts). The bandwidth requirements may vary depending upon the type of implementation namely frame relay/atm private network, or internet based connection.

7.3 Hardware and Software

The following is a list of hardware needed in each data center:

#	Device	Qty
1	NetScreen Firewall -204	1
2	TopLayer IPS 5500 -100	1
3	Proventia Network IPS GX 40002 - C	1
4	Cisco Router 3560	2
5	Cisco Switches 2960	3
6	F5 3 DNS	1
7	F5 BIG IP	1
8	HP Tape Library Solutions	1
9	HP Modular Storage Array 1000	1
10	Citrix MetaFrame Presentation Server	4
11	Citrix Web Interface Server	2
12	Citrix Access Gateway Appliance	2
13	Oracle database servers	2
14	Oracle DataGuard server [ONLY FOR SITE 1]	1
15	Management Servers [SITE 1 – Qty 2 and SITE 2 – Qty 1]	2
16	Windows Directory Services Server	2
17	Racks	2
18	Flat keyboard, Monitor and KVM Switch w/cables	1
19	Power Distribution Units for HP Racks	10

The following is a list of software needed in both data centers:

#	Description	Qty
1	Imaging Software – Vision X	1
2	Citrix Presentation Server, Enterprise Edition	200 users
3	Citrix Access Gateway Standard Licenses	200 users
4	Microsoft Terminal Server Licenses	200 users
5	Veritas Tape backup software	2
6	ISS Server Sensor for Linux	6
7	ISS Server Sensor for Windows	18
6	Windows 2003 Server	18
7	Redhat Linux - Enterprise Edition	6
8	McAfee Antivirus	18
9	MS SQL Server	1
10	TripWire	Bundle of 25 Licenses
11	Oracle Enterprise Edition Licenses	5
12	Oracle Real Application Cluster Licenses	4
13	ILO Licenses	26
14	Quest TOAD for Oracle	2
15	Verisign SSL Certificates	4

7.4 Network Connections

Saber's proposed Electus Software for the WyoReg system does not have any complicated networking needs. Since the application is served in a browser using CITRIX, all that is needed for any authorized user to access the application is regular high-speed internet connectivity. Once the user provides their credentials, they can simply login using the internet browser like IE. The recommended client machine platforms with Windows XP or 2003 are well equipped to handle this need out of the box. Saber will ensure that as part of maintenance we will undertake compatibility testing with upgrades to the Vista platform in the future. Since the application is accessed using a browser, it is our belief that moving to the Vista platform should not be an issue. Saber will keep the state posted on internal vista platform testing.

Saber will assist the State of Wyoming in conducting an initial assessment of the counties connectivity issues using surveys, and advice on the gap that exists between what is needed and what exists. The cost of this assessment is already included in our pricing. However, the cost to bridge the gap in terms of the equipment, services and the effort needed to do so is not included in the proposal, and can be discussed based on the State's needs during the planning phase of the project. Saber will be happy to provide a proposal to undertake this effort if desired after the gap analysis during the planning phase of the project.

7.5 Antivirus, Firewall, Intrusion Detection

Antivirus - Saber will use McAfee Anti Virus software in this architecture. The McAfee Anti Virus software enhances the network with comprehensive multi-tiered virus protection and shields the systems from exploits, viruses, worms, Trojan horses and in-appropriate contents. It also eliminates the possibility of script vulnerabilities and provides silent updating. The McAfee Anti Virus can be configured to download updates from a central repository either on the internet or a repository configured internal to a site.

Firewall - Saber will use Netscreen for Firewall Security in this architecture. Netscreen provides VPN/Firewall security capabilities. This predictable, high performance component also provides strong denial-of-service (DoS) protection and enables network segmentation to minimize unauthorized roaming. Netscreen's secure dynamic VPNs provide a fault tolerant solution, combining the resiliency and efficiencies of route-based VPNs with the security and ease of use of policy-based firewalls.

Intrusion Detection System - Saber will use ISS Proventia for Intrusion Detection in this architecture. ISS Proventia delivers preemptive protection by combining continuous vulnerability assessment and threat prevention with enterprise-wide information management and reporting capabilities. The ISS Proventia can be configured to be used both as detection or a prevention device. The Proventia device provides multi-faceted protection, automatic security content updates, virtual patch protection, spyware installation blocking/spyware communication blocking, quarantine capabilities, corporate network access control.

7.6 Data Hosting

Saber has designed, procured, installed, tested, and transferred to production thirteen datacenters that support Statewide Voter Registration and Elections Management systems. Of these thirteen datacenters Saber is responsible for the maintenance and management for eleven of them; including security monitoring, backup and recovery, availability, and performance of the datacenters. Additionally, we actually manage the physical plant for two of the datacenters (for the State of Maryland) in a Government-Owned Contractor-Operated (GOCO) model. The

following sections will highlight on Saber's proven experience in implementing datacenters that are the same as our proposed solution for Wyoming.

There are a number of advantages in hosting the datacenter at a contractor-provided site. Key benefits include:

- **Cost:** the cost of implementing a reliable infrastructure to host mission-critical services can be significant. Saber has invested heavily into infrastructure and ongoing support, benefiting many clients who share in just a fraction of that cost.
- **Reliability:** redundant, reliable electricity, Internet connectivity, networks, and secure, environmentally controlled facilities are big factors in cost savings mentioned above. A key aspect of the hosting facility design is to eliminate all single points of failure and to provide multiple high-speed Internet connections and carriers, and a well-planned and managed infrastructure to eliminate downtime completely.
- **Security:** Saber's hosting facilities come with stringent security measures, both physical and electronic. Multiple layers of restricted access are standard, as are videotaped monitoring cameras, and multiple layers of network security devices.
- **Timing:** New systems can be accommodated on short notice with instant support and infrastructure. A typical in-house implementation can take weeks or months of planning and execution.
- **Expertise and Support:** By hosting the application, you get access to Saber's world-class team of hardware, network, and security engineers who specialize in supporting mission critical implementations.

Disadvantages

Outsourcing critical functions within government agencies is subject to criticism by those who are not informed of the business and technical logic behind the decision. Saber believes our datacenter experience in other states coupled with the cost and security benefits to the State of Wyoming make our outsourced hosting solution clearly in the best interests of the state.

7.6.1 Services Provided

Saber will perform all the necessary steps for the setup and initial configuration of all servers, network hardware, backup system, and physical space in the hosting site for the WyoReg system. This will include the following major elements:

- Unpacking and cataloging all equipment, tracking serial numbers, system types, and any related system software.
- Rack mounting all servers, network hardware, backup hardware, and storage of any backup media.
- Set up all equipment in the racks as specified by the Saber schematic.
- Visio drawings and in strict conformance with standard practices and guidelines or any state mandates..
- Cable and connect all equipment within the working spaces of WyoReg.
- Power connections will be installed and tested.
- Airflow testing will be conducted for proper ventilation and climate control.
- Diagnostic testing of all new equipment will be performed to ensure proper operation.
- Establish and maintain all server and network hardware documentation and vendor support contracts for the servers, network hardware, and backup hardware.

- Maintain inventory of all state-owned (but in Saber possession) hardware and software, and provide a list of such inventory to state at the beginning of the Hosting Center operation and every year thereafter.

7.6.2 Managing the System Operations

Saber will provide all staff to manage the WyoReg operations. This staff will include Oracle database administrators, Linux system administrators, network engineers, security engineers, Citrix administrators, and a technical services manager to oversee smooth datacenter operations. Services typically offered under Saber's standard Service Level Agreement (SLA) include:

- 24/7/365 security monitoring
- Continuous system monitoring and performance tuning
- Data back up, recovery, and archive services

7.6.3 Proposed Data Center Environment

Physical Space: The overall physical space requirement for each cabinet is 24" wide x 36" deep x 8' high. In addition to the 36" depth of the cabinet, another 48" of depth is needed to accommodate the front and rear doors. The space will be in a caged area in an existing temperature-controlled, secure facility with backup power. The facility and the caged area will have a securable door with a minimum width of 36" for equipment ingress/egress. Authorized staff from both Saber and Wyoming state staff will have access 24X7 to the cabinet's Operations Center (all racks). Approximately 50 square feet will be provided for the two racks, and space to bring equipment in, set it up, and break it down if re-configuration or maintenance work is needed.

Fire Suppression: The data center will employ a fire suppression system that meets or exceeds best practices. The standard for computer rooms is a detection and pre-action sprinkler system. This standard was selected to provide an effective, more "people safe" approach than that of inert gas. The sprinkler system is not charged until smoke is detected by two smoke detectors, one at floor level and one above the equipment. At the time of detection, a local alarm sounds and the power is cut. There is a short time delay where an operator can override the power shutdown. After the equipment is shutdown, fire still has to melt the fusible link in a sprinkler head before water comes out of that specific sprinkler head. Because power is off, the likelihood of fire is decreased. If the fire is strong enough to melt the fusible link, the computers are likely already not salvageable.

Heat and Humidity Controls: Overall temperatures will be maintained between 50 to 75 degrees Fahrenheit and the overall humidity must be within the 20% to 80% range. The overall cooling recommendation for the proposed equipment is at least 1½-ton AC unit to support an approximate displacement of 31,805 BTUs from the equipment, without consideration for the Uninterruptible Power Supply (UPS) units. The hosting facility is a commercial datacenter with heating/cooling/humidity controls that exceed best practices.

Environmental Monitoring: The overall data center is monitored and environmental data is captured, recorded, and reported by time stamp and metrics. The metrics, beyond physical and electronic access, that should be recorded to ensure overall data center operations include temperature, humidity, and fluid detection.

Uninterruptible Power Supply (UPS): The overall UPS requirement for the WyoReg data center will be 14KVA unit at maximum loading. Power backup facilities include UPS unit(s) with a minimum one-hour battery backup time to ensure a smooth transition to generated power.

Backup Generator: The backup generator is sized to the chosen UPS unit(s) and with electrical switching installed in the current path from power feed to UPS unit(s). The generator is located outside at some distance from the facility with a fuel storage tank adequate for the maximum anticipated run-time without normal power distribution.

Physical Security Requirements: A high level of integrity for the physical security of the equipment will be maintained. The WyoReg co-location datacenters will be housed in secure facilities. The buildings will have multiple levels of restricted access and WyoReg will benefit from four-tiered physical security program:

- Access to secured areas of the facility is by electronic fob access only.
- Access to the datacenter is achieved only with a staff escort. Doors are controlled by passkey only.
- The WyoReg equipment cabinets will be situated in a 13x13 locked cage. Keys to access partitioned space will be held by staff only.
- Locked data cabinets will house WyoReg equipment. Keys to these cabinets will be retained by staff only.
- All public and private areas of the datacenter are monitored 24x7 by digital video cameras.

Connectivity Requirements: Our datacenters are designed to be redundant and the data centers will be geographically dispersed. Although this mitigates the primary purpose of having redundant data connections, the mission-critical nature of the WyoReg application mandates additional connectivity, which adds to the overall resiliency of the fail-safe design.

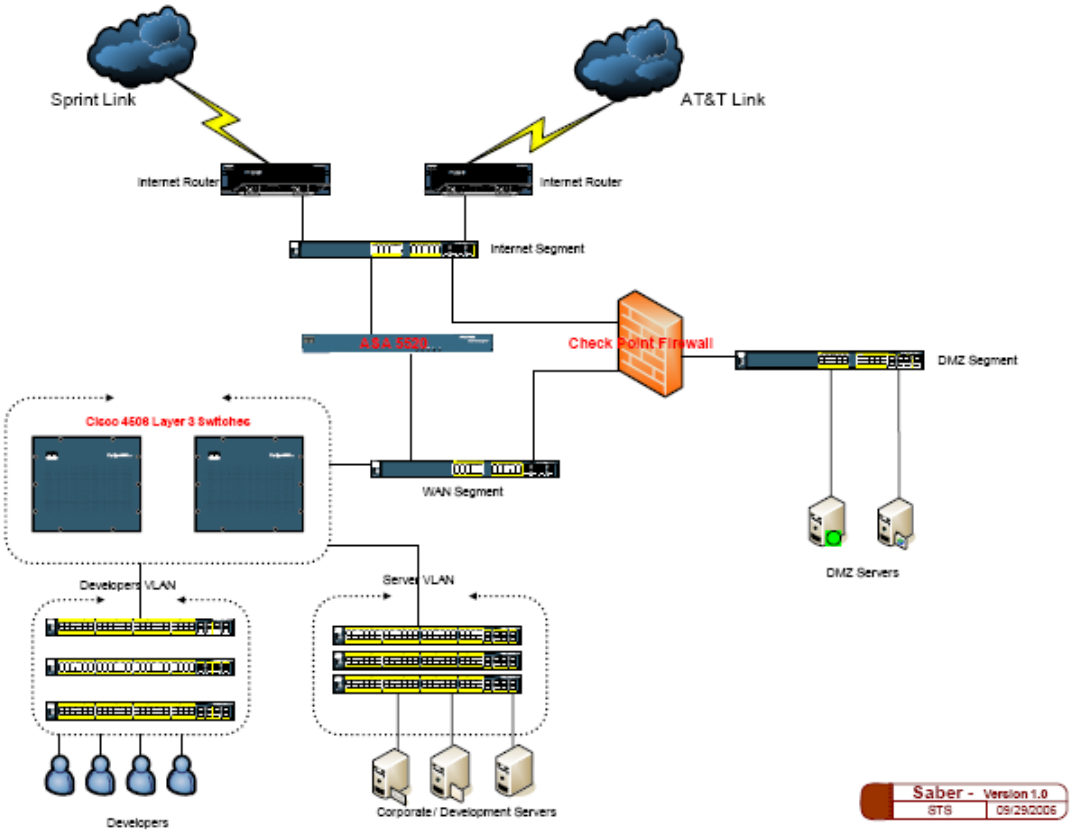


Figure 11. Saber Data Center in Dublin, Ohio

Saber will be responsible for network problem tracking and resolution from the point of connection to its datacenter but will not be responsible in any way for connectivity issues that the county may have from their desktops. Any problem diagnosed as county network issues will be passed on to the county end user. Saber will provide a county notification to the State. We can provide more information, if the State desires.

7.6.4 SLA Highlights for Data Center Hosting

Saber is providing a summary of our standard SLA document. Given the opportunity to host and manage the datacenter, we would commit to the following SLA:

Service	Level
Application Availability	99.99%
Local Area Network Availability	100% (does not include county networks)
Data Base Availability	99.99%
Response Time	5ms for round trip transaction, measured from demark point of state network, to WyoReg and return to demark point.
Backup success	99.9% (assumes tape backups and successful completion of backups of all data sets on daily, weekly and monthly schedule).
Backup completion	99.99% (backup window is not exceeded).
Backup validations	100% (validation that backups can be used to restore either individual data elements and or restore entire system. Tested quarterly)
Hardware availability	100% (assumed achievable due to clustering of all environments)
Application problems Priority 1 and 2	No more than three (3) "Severe" and five (5) "High" problems monthly after the go live pilots of operation. After the first three months no more than one (1) "Severe" and three (3) "High" problems monthly. The State and the vendor will mutually agree upon a reasonable number of priority level Medium and Low issues. However, Saber will ensure that all Urgent-Show Stopper (Severe) Issues will be promptly responded to and fixed as part of support.
Mean Time to Repair (MTTR - the amount of time between failure and repair to full functionality)	% Application Availability = (MTBF * 100) / (MTBF + MTTR) Mean Time Between Failures (MTBF) is the average time device functions before failing.

Below we provide highlights from our SLA document.

Data Center Hosting Service Level Agreement

Section I: Overview

Description of Services:

Data Center: Saber will secure a dedicated space for the Wyoming WyoReg equipment. This space will include a separate restricted barrier for entry, a locking four-rack data cabinet, necessary power, and redundancy to enable a high level of network performance. This space will be monitored on a 24/7/365 basis. Additionally, with this dedicated space, a workstation area will be established and maintained for network support and testing. The total space allocation will be approximately 50 square feet of floor space per site.

Procurement: Saber will be responsible for the procurement of network routers, power distribution units, data lines, and monitoring hardware/software that is to be used to support of the WyoReg system on an ongoing basis. In addition, Saber is responsible for the receiving and tracking of all hardware and software that is to be used to support the WyoReg system.

Installation and Configuration: Saber will be responsible for the oversight and project management for installation and configuration of network hardware, server hardware and data lines, and monitoring equipment as per provided layout plan. All installation processes will be documented for proper methods tracking and disseminated to named contacts.

Vulnerability Testing of Servers and Network: Saber will conduct and document vulnerability assessments on the WyoReg network and servers contained within the network.

Network Support, Monitoring and Backup Services: Saber will support the network infrastructure (up until the connection to the Wyoming network or data center) of the WyoReg system. Saber will manage and monitor the network connections to the state office. Saber will also manage the backup tape system, rotate tapes, and provide a secure location for storage. Saber will also support the solution by application by managing operating systems and patches. Network administrators will also perform other necessary functions to support this solution.

System and Software Training: All essential Saber staff will be thoroughly trained in backup and disaster recovery, network monitoring, documentation, ticket tracking, and problem resolution as applied to the infrastructure. Essential Saber staff will be knowledgeable in both the server and network configuration to ensure seamless problem identification and timely resolution.

Server and Network Monitoring

Redundant Intel servers will be used to run the monitoring software (IPswitch What's Up Professional). These servers will serve the primary function of:

Windows Service Monitoring: Keep track of critical application functions, with unlimited Windows service monitoring. Minimize downtime by allowing What's Up Professional to restart any failed Windows service automatically.

TCP/UDP Port Monitoring: Check the status of individual ports on the network and isolate failures. Utilizing customizable scripts to communicate with the application using a specified port.

Event Log Monitoring: Identify potential harmful events such as authentication failures or faulty NIC card. Select Windows Event Log or Syslog items to watch for and immediately alert if necessary.

System Resource Monitoring: Understand when reallocation of network resources is necessary. Track the utilization levels of critical resources such as CPU, disk space, memory, or bandwidth with Simple Network Management Protocol (SNMP) threshold monitoring. Know immediately if these or other resources fall outside of acceptable ranges.

Maintenance Mode: Schedule device maintenance to ensure accurate monitoring and reporting of device status. No false alerts or downtime statistics are generated when a device is in maintenance.

Saber uses a SLA Management tool called Indicative to manage our service levels. Indicative monitors service levels, user experience and third party capabilities relative to the underlying infrastructure health. By proactively testing service quality, Indicative anticipates problems before they impact the business and customers. Indicative products automate actions to notify personnel and even third party providers of service quality issues.

Section II: Vulnerability Testing of Servers and Network

WyoReg Microsoft Windows Servers:

Server Vulnerability Testing on all Windows Servers will be completed using Microsoft Baseline Security Analyzer. This testing will be run after the initial setup of the network, after Saber has installed the software base for the WyoReg system, and thereafter on an ongoing basis. Any vulnerabilities found will documented and disseminated to the appropriate state contact specified with the recommended best course of action to address the issue.

Network Vulnerability Assessment

Saber's proposal provides for 24x7 security monitoring and network monitoring for all states for which we manage datacenters. This assessment will:

- Scan servers on the network for open ports and potential vulnerabilities.
- Scan routers and switches on the network for open ports and potential vulnerabilities.
- Assess possible routes and means for exploitation of open services.
- All findings that are determined to have the potential for a network or system compromise will be documented and addressed in cooperation with designated state staff.

Section III: Network Support, Monitoring, and Backup Services

Network Support includes the following:

- Full-time dedicated support technician, who will serve as the primary contact and system/backup administrator.
- All support staff trained on the overall system configuration, critical services, network topology, and hardware.
- Separate/private support queue for all service related to the WyoReg system.
- Operating system patches, updates, security audits will be applied after successful install of the WyoReg system.
- Specified software upgrades and testing
- Network troubleshooting and diagnostics
- Network monitoring/server monitoring
- Monitoring system includes web based stats, network mapping for easy viewing and diagnosis of network events
- Full reporting capability will be provided on the uptime of the servers, network interfaces, windows services
- Specified critical windows services will be monitored and automatically restarted by monitor servers.
- Saber staff will be immediately notified by pager and email of any network and server events.
- Web, SQL, Mail, etc. any TCP/IP service specified will be monitored, and have full reporting capabilities. This list to be determined by Saber and system administrators.
- Monthly reports on status and availability will be emailed, and printed for historical archiving to the state.
- Any security breach will be reported immediately to the State.
- State will be notified of regular maintenance schedule.
- State will be notified of emergency maintenance prior to notification of users.

Monitoring

Saber will procure and install necessary equipment to monitor network connections 24x7x365 for reliability and performance.

- Monitoring system will be fault-tolerant to ensure continuity in performance
- Will check availability of individual network ports.
- System will notify specified Saber personnel about connectivity/availability issues. Notification will be multi-tiered by e-mail, text messaging, and other means.

Power Management

For power management, the WyoReg system will utilize ten 20Amp APC 7930 Power Distribution Units, and one APC 9420 management unit. When bundled with the APC9420 Management Unit, all ten Power Whips will be managed through one web or console interface and provide the following management features:

1) Centralized Management Console
2) Data Logging
6) Load Management
7) Notification Groups

3) Event Logging
4) Global Threshold Alarms
5) Inventory Reports
8) Browser Accessible
9) Power Flow Diagrams
10) Recommended Actions

7.7 Backup and Recovery

Saber will create, provide, and maintain the following backup and recovery services for the primary system. This includes all servers hosted at the Saber datacenter.

- Install and configure backup
- Off site storage
- On site storage
- Backup log verification
- Historical data storage
- Adding databases to backup cycle
- Integrity of backups
- Testing of database recovery
- Backup register maintenance

Off-site storage specifications:

- A daily incremental backup of new and changed data will be taken off-site and stored securely.
- On weekends, a full data and software backup will be taken off-site and stored securely.
- A minimum of three copies of each data set will be maintained and two sets will be taken off-site and stored securely
- On a regular basis to be determined by the Saber backup administrator and the system administrator regular recovery testing will be conducted.

Backup and recover procedures will be documented in the users manuals as well as the operations manuals and provided to the state.

The Oracle database proposed provides a large number of backup and recovery options several of which will be used in conjunction to provide complete point-of-failure recovery. Point-of-failure recovery is defined as recovery with no or minimal data loss (as opposed to point-in-time recovery that is defined as recovering the system to some point in time with data loss after that point in time).

For data protection and disaster recovery Saber proposes the following best practices that should definitely be followed. If these practices are followed, the State will have a true high availability data solution with automated backup, and will be able to restore, and recover in the event of a disaster.

1. Use Oracle Recovery Manager (RMAN) to perform the backup
Recovery Manager (RMAN) uses server sessions to perform backup and recovery operations and stores metadata about backups in a repository. RMAN offers numerous advantages over typical user-managed backup methods, such as the ability to do online database backups without the need to place tablespaces in backup mode; support for incremental backups; data block integrity checks during backup and restore operations; and the ability to test backups and restores without actually performing the operation. RMAN automates backup and recovery, whereas the user-managed method requires you to keep track of all database files and backups. For example, instead of requiring you to locate backups for each data file, copy them to the correct place using operating system commands, and choose which logs to apply; RMAN manages these tasks

automatically. Additionally, there are capabilities of Oracle recovery that are only available when using RMAN, such as block media recovery.

2. Use a Recovery Catalog
RMAN automatically manages the backup metadata in the control file of the database being backed up. We can define a retention policy that meets or exceeds best practices.

3. Run the Oracle database in ARCHIVELOG mode
To enable complete point-of-failure recovery, the databases must be run in ARCHIVELOG mode. This simply means that the Oracle DBMS archives filled online redo log files before reusing them in the cycle. This is the only way of ensuring point-of-failure recovery because this is the only method to backup the database while it is open and usable; all other backup methods required the database to be closed and unusable (not an option in a 24x7 environment). The only downside in using the ARCHIVELOG is that extra disk space and extra tapes (only archive logs from one of the three sites need to be stored on offline media since all databases are replicated) are required to store the archive logs. ARCHIVELOG mode delivers the following benefits:

- The database can be recovered from both instance and media failure.
- The user can perform online backups, i.e., back up tablespaces while the database is open and available for use.
- Archived redo logs can be transmitted and applied to a standby database, which is an exact replica of the primary database (this will be done using Oracle Data Guard described below).
- Oracle10g supports multiplexed archive logs to avoid any possible single point of failure on the archive logs.
- Additional administrative operations can be performed to store and keep track of the archived redo logs.

4. Use Oracle Data Guard to create a hot standby database
Oracle Data Guard manages a synchronized copy of the production database Oracle Data Guard manages the two databases by providing remote archiving, managed recovery, switchover and failover features. In addition, Oracle Data Guard provides:

- Disaster Protection
- Protection from human errors
- Protection from data failures
- Read-only option for the standby database for reporting
- No data loss or minimum data loss options
- Offload backups at the physical standby database for production database recovery

Periodically test recovery procedures

The best backup procedures are no good if for any reason the data backed up is corrupt for any reason (media failure or block failure). For this reason, Saber will work with the State to develop and implement a recovery test plan. The Oracle RMAN tool described above provides tools to automate the testing of the backups and makes it very easy to create and follow a procedure to test backups (using the BACKUP…VALIDATE and RESTORE…VALIDATE commands).

Network and Server Backup

All the network devices and servers are backed up regularly on disk and/or tape. Saber's backup policy requires a backup to be taken each time there is a change in configuration on any of the network devices or servers.

Failover Test

In the MAA architecture, we have two datacenters that are both active. It is critical to have a secure failover from one site to the other in case one site goes down. As part of our preparation of the data centers for production we prepare for this through failover testing. If one datacenter fails to respond, the system should switch it off and reset it while moving users to the alternative active site.

Failover testing is conducted prior to go-live with the help and involvement of the county and the SOS users. The users are logged on to a site and then this is brought down in a planned fashion. When this occurs, all the users currently logged into that datacenter will be immediately logged off and will need to log back in to the system. When they re-login, users should be rerouted to the active datacenter. This indicates a successful failover and ensures that the architecture will be able to handle the up-time availability needs of the production system.

8. THE APPLICATION

8.1 Proposed WyoReg Key Features

Saber's enterprise class Voter Registration and Election Management System, Electus, will form the baseline for the WyoReg system. Saber built this system from the ground up to be HAVA compliant. This means that Electus was built as a statewide, centralized, and interactive database, fully compliant with the requirements of HAVA; it is not just a county system that has been "stretched" to serve the needs of a statewide system. Electus is a highly flexible and data driven system that can be easily customized to meet the specific requirements and needs of each state. This user-focused system enables and ensures the success of all of the important stakeholders of a centralized voter registration system including the Secretary of State's office, the counties, the political parties, the candidates, and the citizens of each state.

Key features and modules of the system include:

- Fully HAVA Compliant
- Voter Registration Management
- Integrated Imaging and Bar Code Scanning
- Voter Query Management
- District and Precinct Management
- Address Rules Management
- Elections Management (Candidates & Measures)
- Absentee Management
- Polling Place Management
- Elections Workers
- Petitions Management
- Complete reporting and ad-hoc query capabilities with over 100 reports included
- Open APIs (Application Programmatic Interface) for interfacing with DMV, Corrections, Vital Records, and other external agencies.
- Robust Role-Based System Security and User Access Module
- System Administration and Configuration Module
- Complete set of user and system documentation

Potential enhancement modules include:

- GIS system interface
- Election night reporting
- Interfaces with tabulation machines
- Public access
- Web portal for delivering voter extracts
- Candidate filing workflow
- Petition certification workflow
- HTML ballots for physically challenged
- Early voting
- Vote center management

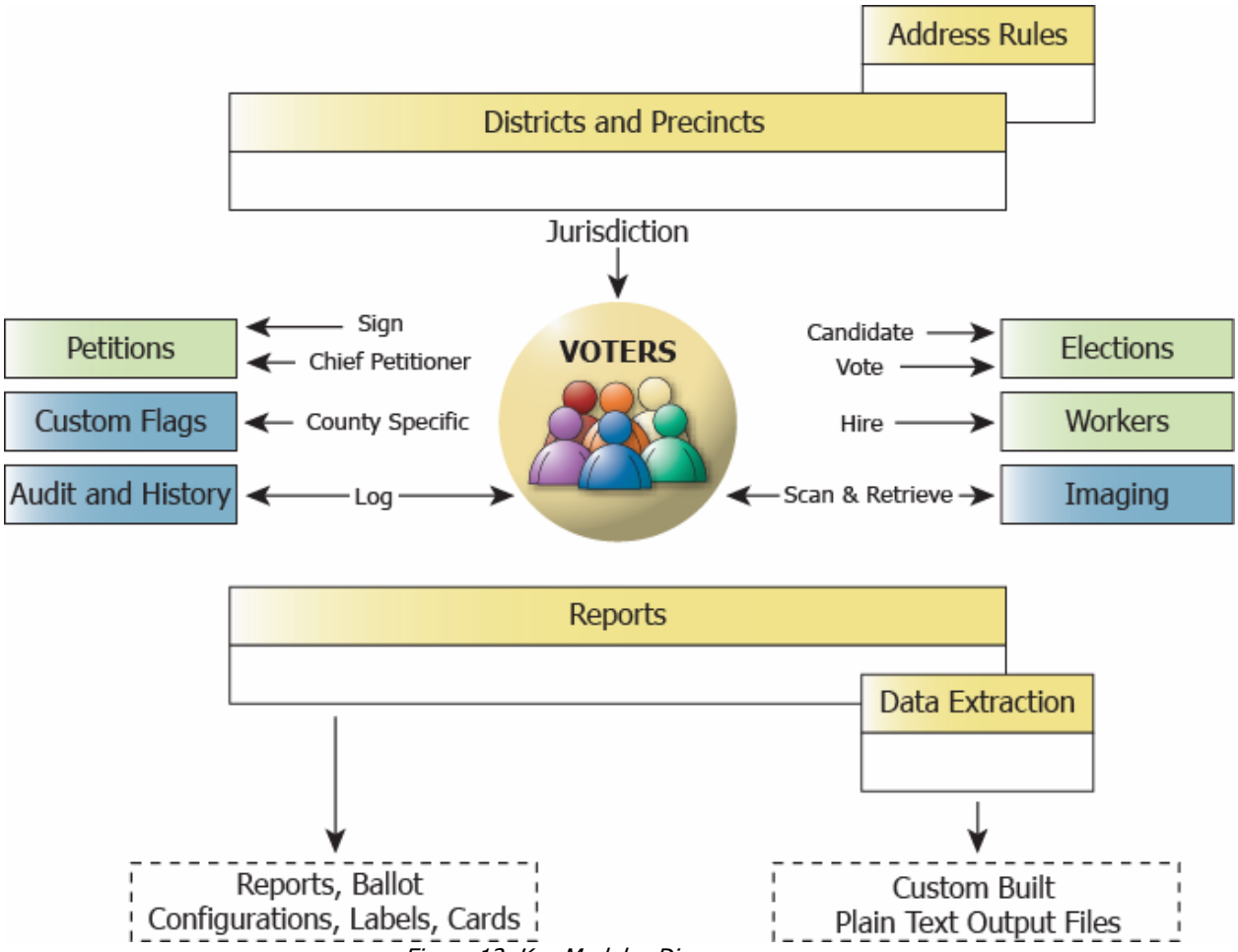
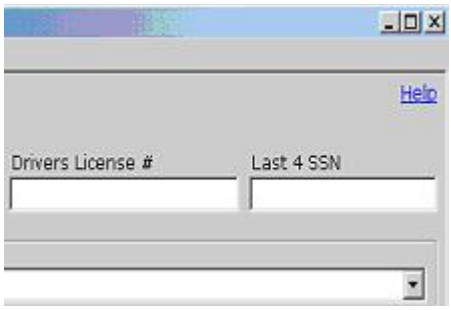


Figure 12. Key Modules Diagram

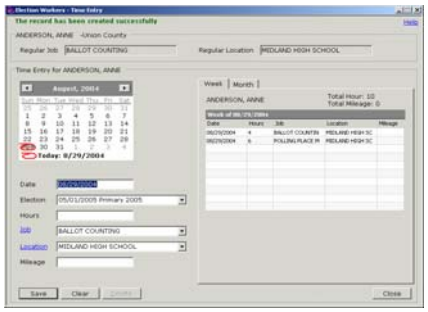
Electus is fully compliant with the Help America Vote Act. Following are the main HAVA compliant features of the application:

- The system provides a single statewide database of registered voters, voting records, voting histories, election information, petitions, district and precinct information, polling place and candidate information. All information is saved in and presented from and a single statewide database. The system database is based on relational modeling techniques and is easily accessible to authorized users to inquire information for their own county or statewide.

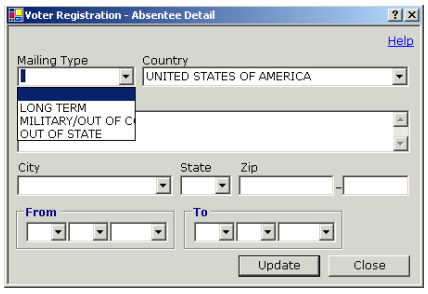


- The system provides the ability to track voters using their driver licenses and SSN (last 4 digits). These two fields are initially captured in the voter registration module and are associated with the voter records throughout. The system has the ability to interface with the Social Security Administration (SSA) and the Department of Motor Vehicles (DMV) to validate the numbers.

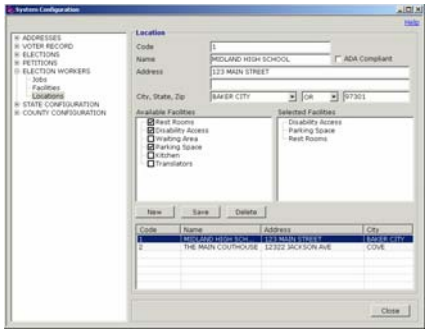
- The system automatically assigns a statewide unique identifier number to each voter record. The ID remains the same throughout the life of the record and is carried forward when voters move between counties. In addition, the system tracks the old voter ID number when first implemented in the state.



- HAVA calls for encouraging college and high school student participation in the political process as volunteer poll workers. The system comes with a complete and comprehensive election workers management module. The module allows for counties to run an inquiry on their voters to identify those who have volunteered as election workers either in their own county or in another county.



- HAVA calls for improving ballot access for military and oversees voters. The system comes with a powerful absentee ballot management module that allows the system users full control over the timing and processing of all types of absentee voters.



- The system has the ability to identify and maintain all available facilities (such as parking capacities, handicap accessible, etc.) for a polling place. To especially cater to voters with disabilities, the system allows the capture of special needs for each voter record. The needs identified are user defined. The system also provides directions and maps for polling places.

8.2 WyoReg Baseline Modules and Functional Requirements

8.2.1 Voter Registration Module

Electus comes with a comprehensive Voter Registration Module that covers all of the functions needed to manage a statewide voter registration database. All the following features will form a part of the baseline WyoReg application to be built for the State of Wyoming.

The Voter Registration screen combines most of the features needed for maintaining the voter record on a single screen. Functions available on this screen include, but are not limited to:

- Entering new voter registration information
- Updating an existing voter record
- Entering absentee mailing information
- Scanning images of the voter registration cards and other documents related to the voter
- Printing a copy of any of the scanned images
- Processing ballots that are received
- Processing petition signatures
- Searching for a voter by voter id number
- Printing individual labels
- Verifying signatures

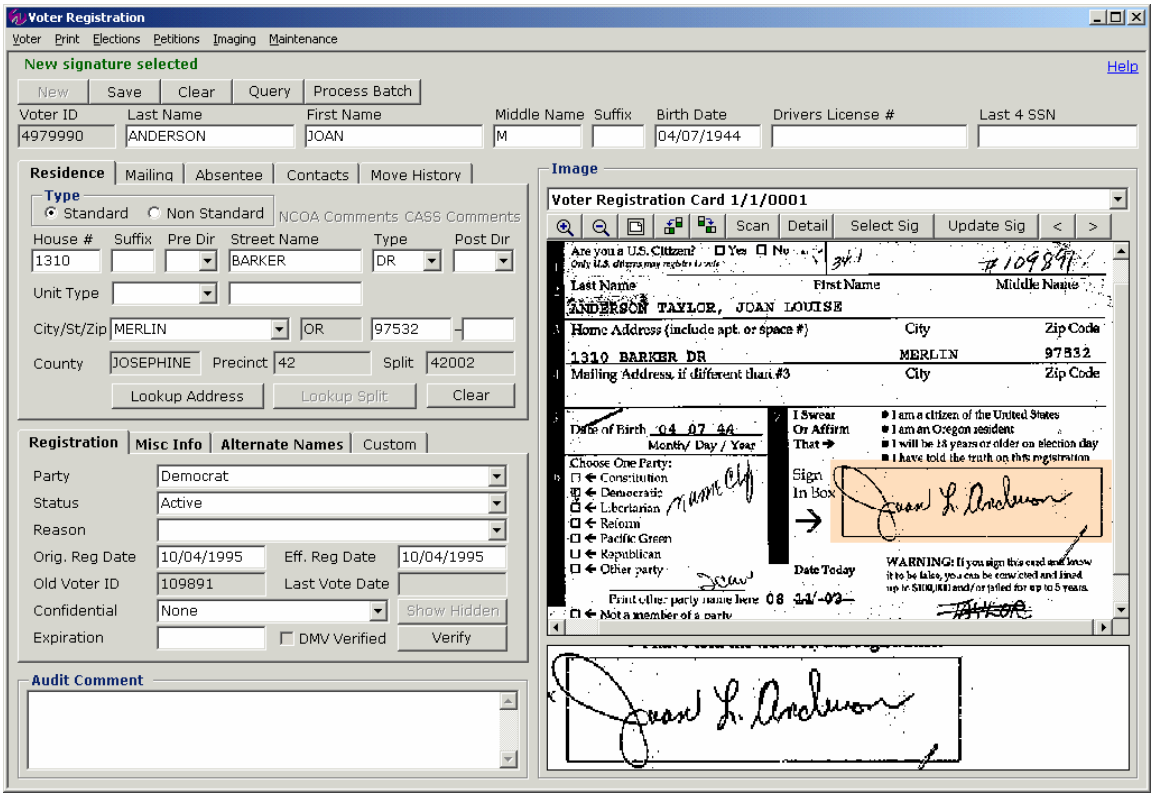


Figure 13. Electus Screen Shot

8.2.2 Duplicate Voter Checking

Electus tracks duplicate records at more than one level. The first duplicate check is performed in the data migration stage before the system is rolled out to production. The result of this duplicate check is a report that can be distributed to all counties to verify and eliminate the confirmed duplicates. This report remains available in the system for future verification of duplicate voters and can be run by the State whenever needed.

DUPLICATE VOTER REGISTRATION
For Marion County

VOTERID	FNAME	LNAME	MNAME	DOB	COUNTY	LEVEL
123456789	John	Brown		05/11/68	Marion	1
123445678	John	Brown		05/68	Jackson	2
122334456	John	Brown			Clackamas	5
233445567	John	Brown	London		Crook	3
223456788	John	Brown	Jay		Coos	3
877854543	John	Smith		04/08/54	Marion	3
235357754	John	Smith	C	04/08/54	Marion	3
323555122	John	Smith	Clark		Washington	6

Figure 14. Potential Duplicate Voters Report

The report uses a pre-defined logic (with user defined confidence levels) to detecting potential duplicates. The logic of the report identifies several scenarios (levels) to identifying and detecting duplicate voters. Each of those levels is explained in the following list.

- Match the Last Name, First Name, Middle Name, Suffix, and Date of Birth
- Match the Last Name, First Name, Middle Initial, Suffix, and Date of Birth
- Match the Last Name, First Name, Suffix, and Date of Birth
- Match the Last Name, First Name, Middle Name and Suffix

In addition, the counties users can verify potential duplicates in real-time when the records are being entered to the system. Once the user has finished entering the required key data fields, the system will verify the entered data against the stored records. If the system detects any potential duplicates, it will pop up a screen that has all the potential duplicate records with the one being entered. The system displays the voter signatures in the list for accurate and quick verification. The system displays the signatures of the potential duplicates in the list for easy comparison.

Figure 15. Potential Duplicate List

The definition of the criteria and the weight of each scenario is user defined. The system comes with a very powerful feature that allows the state administrators to create any number of duplicate configurations while assigning a confidence levels for each configuration. The administrator can select the fields that apply for each configuration. When the user enters a new voter, the system compares the entered data against records saved in the database according to the various configuration levels.

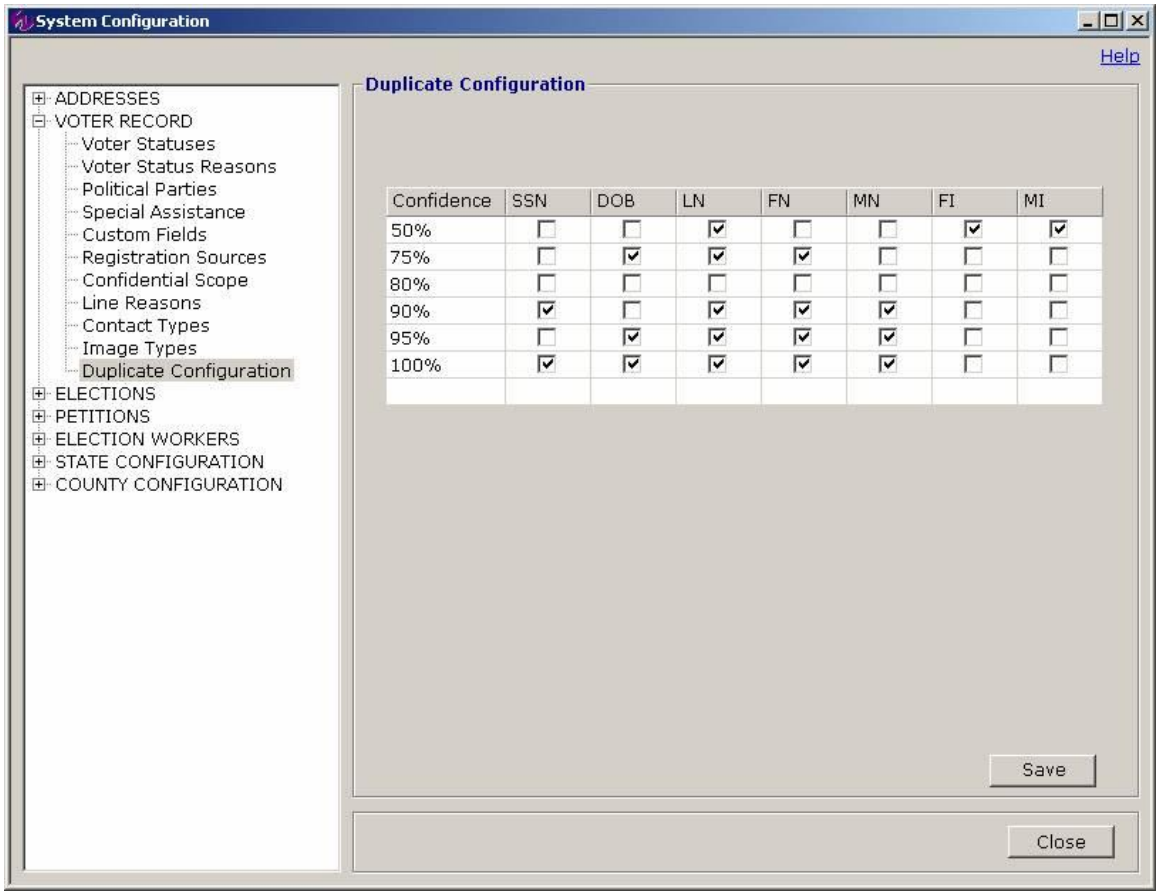


Figure 16. Duplicate Parameters Configuration

To resolve existing duplicate records, the system provides a powerful merge and unmerge feature to combine any number of voter registration records for the same individual and preserve all information of the selected survivor. The system allows users to compare potential duplicate records side-by-side to decide whether to merge the duplicate records or mark them as non-duplicate. The system also gives a summary report of which records are marked as duplicates and which as non-duplicates as a final merging step.

8.2.3 Integrated Imaging Module

The Electus system comes with a powerful image management module that allows for the scanning of all types of documents and forms including the voter registration card. The process starts with the system's ability to identify any number of forms or documents. In each document definition, the system will store the method of identifying the document and the location (or coordinates) of the signature.

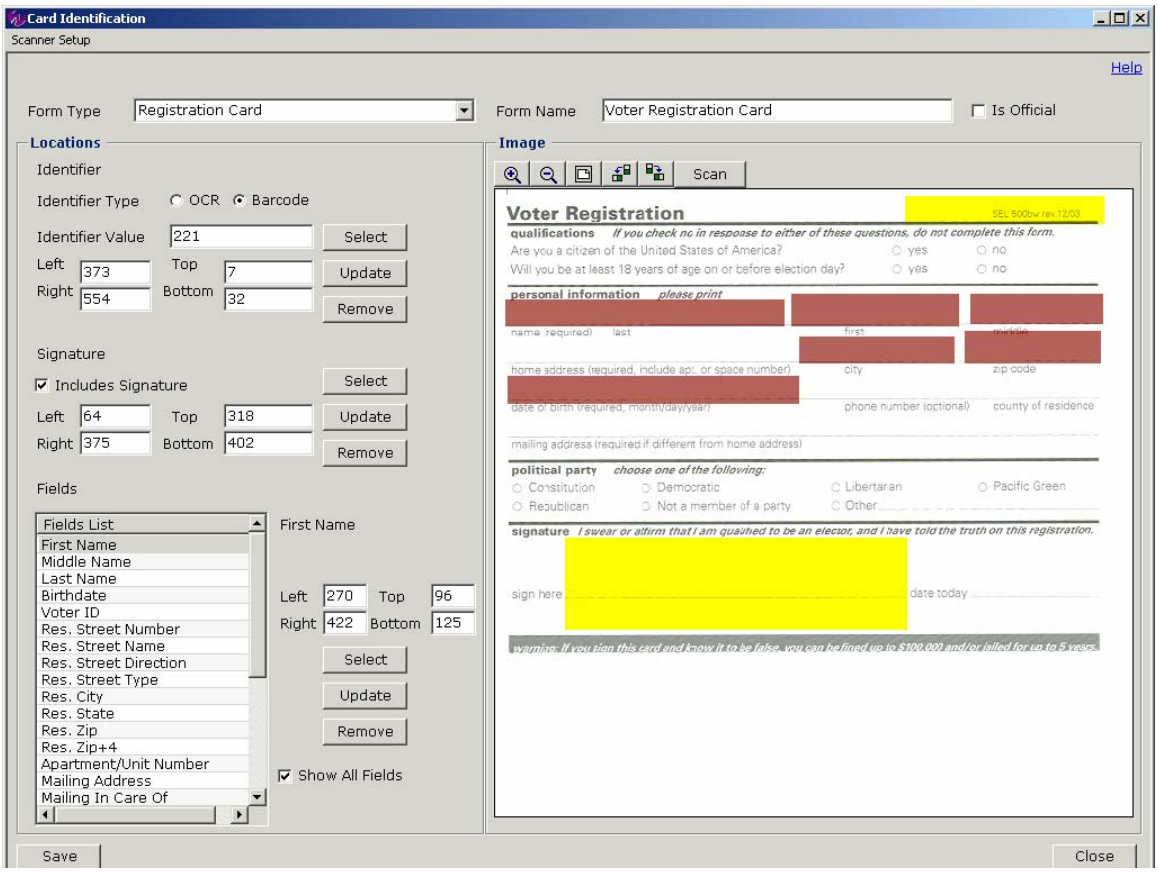


Figure 17. Form Identification Screen

When the user scans an image, both individually or in batch mode, the system will recognize the type of the image and will detect the locations of the signature on the image. The system will then extract the signature into a separate file for faster processing when displaying the signature in query screens and the various signature verification functions.

Electus is equipped with OCR capabilities for form identification purposes and possible data recognition when the data fields are consistent and typewritten. The system is capable performing OCR-ing in a single document scan mode or in batch scanning mode. The system comes with a module to identify the various forms that can be scanned in the system and identifies the locations of the various fields on each form, including the location of the signature. When a form is scanned, the system detects the types of the form either by a bar code or by OCR-ing a specified zone. Along with Code 128 and its variations (UCC-128, EAN-128, SSCC-18 and SCC-14), barcodes that can be also be read by the software are:

- Codabar
- Code 39 (Code 3 of 9)
- Code 93
- UPC-A
- UPC-E
- POSTNET (POSTal Numeric Encoding Technique)

8.2.4 Address Library Management

Electus comes with an address management system that allows for the definition of address rules in each county. When a user enters a valid address, the system automatically verifies the address against the pre-defined rules and assigns the precinct and split code (Jurisdiction Code). The system also allows for the entry of non-standard addresses. In this case, the system will allow the user to manually assign the precinct code.

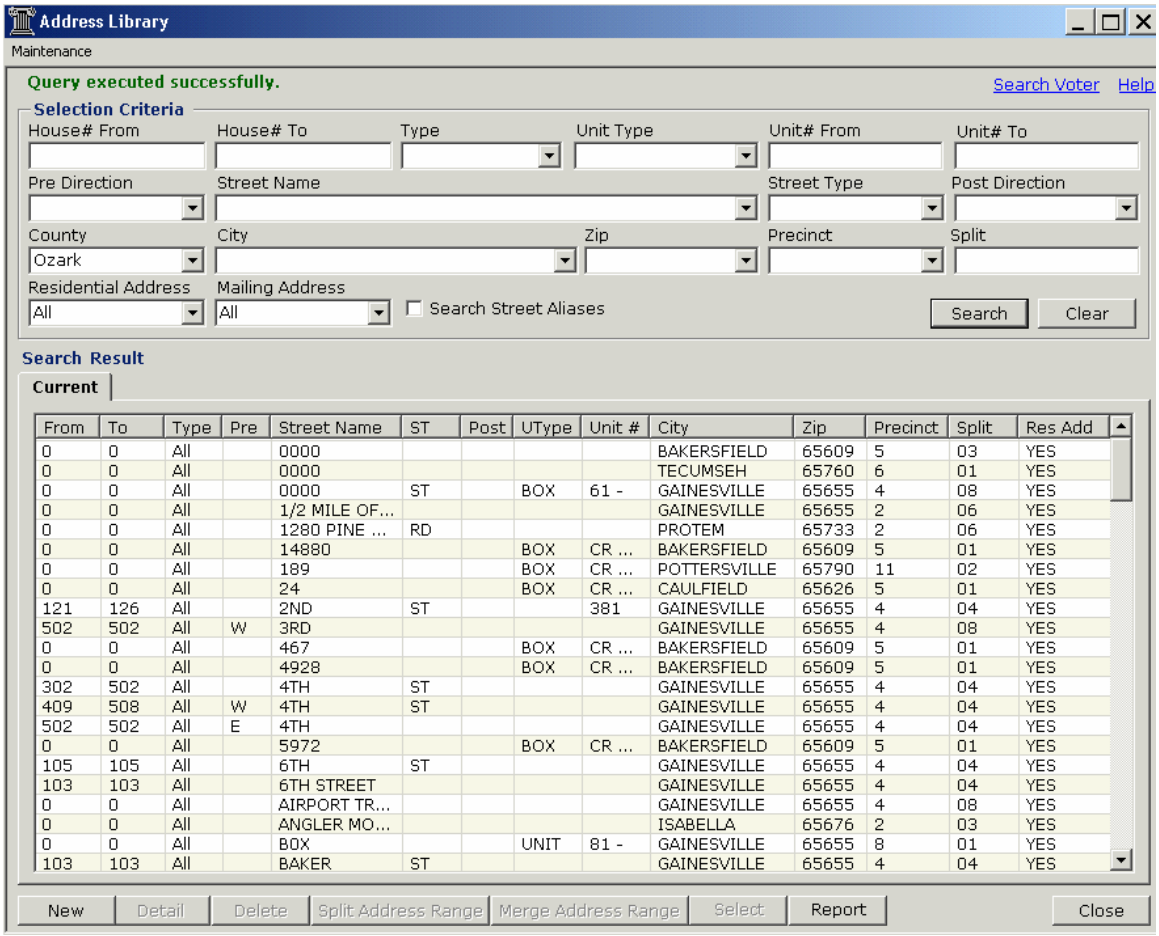


Figure 18. Address Library Management

This Address Management Module allows the users to search, modify, add, delete, split and assign precincts to any ranges of address rules. The module allows the users to search, modify, add, delete, split, and assign precincts to any ranges of address rules. The system allows for the direct application of the changes into the database.

The system follows the USPS standard address format as shown in the figure below:

- House number
- House number fraction
- Pre-direction
- Street name
- Street type
- Post-direction
- Unit type
- Unit number
- City
- State
- Zip code
- Zip +4

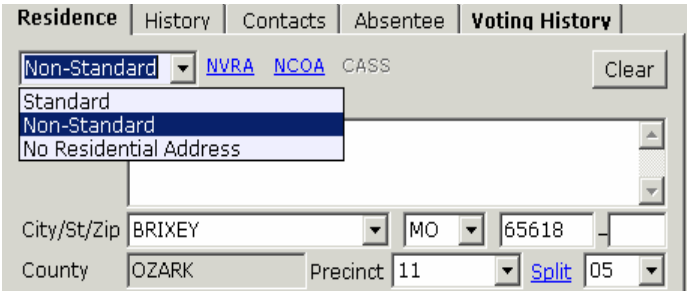


Figure 19. The Voter Residential Address

When the user enters a voter's residence address, the system analyzes the entered address and looks up the relevant precinct and district split codes. If the system does not find a matching rule, the system will bring up the address rules screen from the user to verify the address and make the necessary changes in the users access level allows.

The system also allows for the entry of non-standard addresses. In this case, the system will allow the user to manually assign the precinct code.

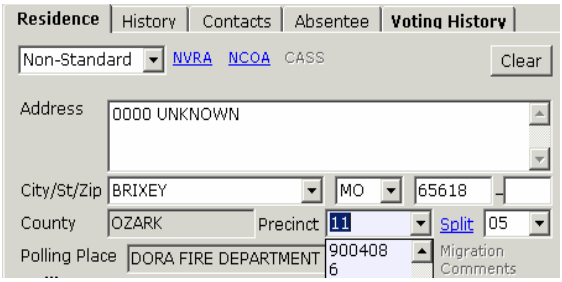


Figure 20. Entering Non-standard Addresses

The system allows for the marking of any number of ranges of addresses as "Unusable." The system prevents those addresses from being used in the residence address of the voter registration module. However, authorized users can assign an unusable address to the voter record if the user's access rights allows.

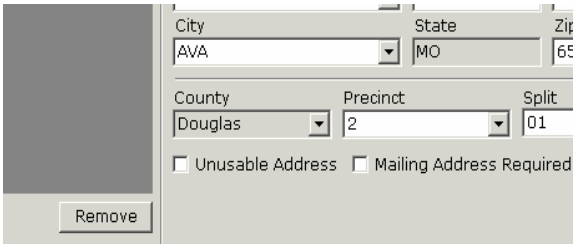


Figure 21. Marking an Address as Unusable

8.2.5 Districts and Precincts

The systems allows for the creation of unlimited number of precincts and districts. Authorized users can add, edit, and delete districts and precincts. To facilitate the process of creating new districts and precincts the system allows a user to copy existing districts and precincts and then provides the ability to modify them as appropriate.

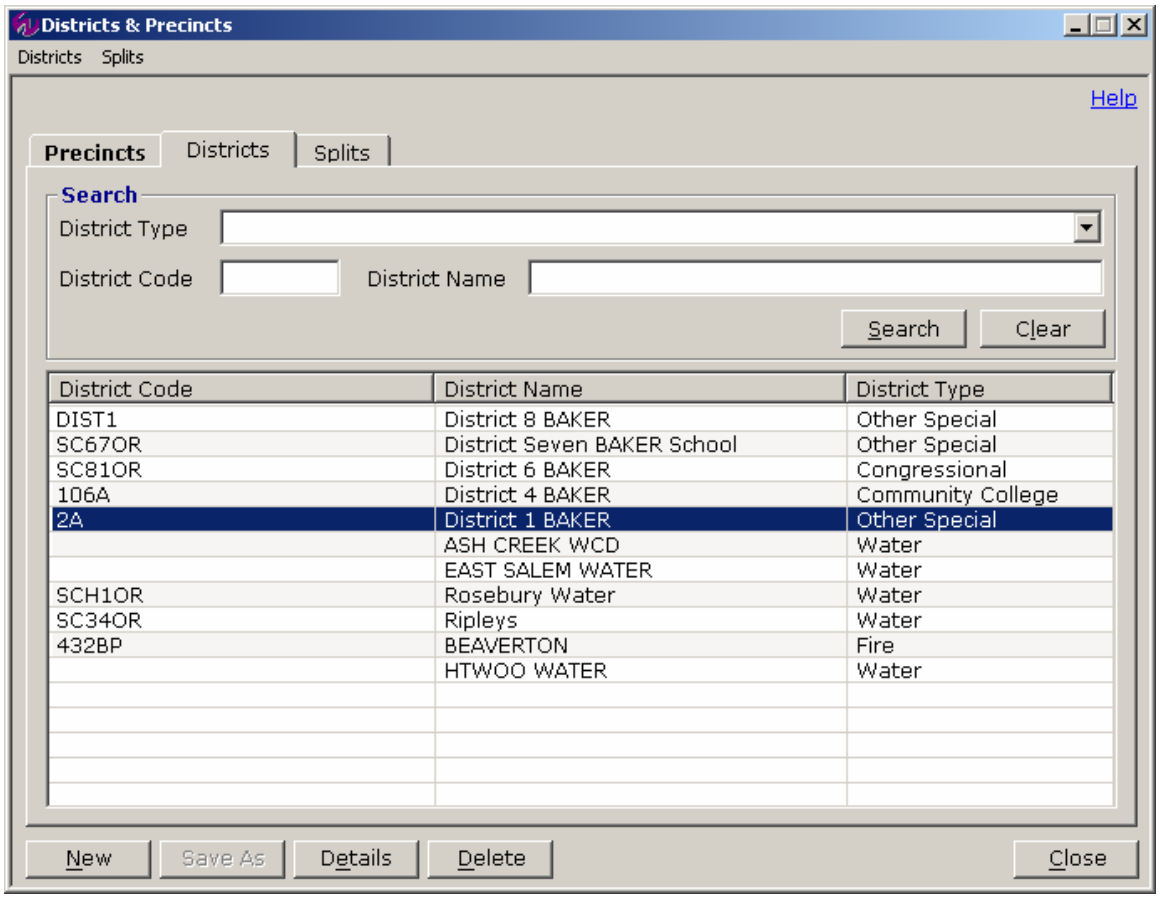


Figure 22. Districts and Precincts

The system has the ability to assign unique identifiers to define each precinct number. An identifier is assigned to each district split within a precinct. Each precinct has a table that defines the unique jurisdictional combination of each split within a precinct. Each precinct is linked to a group of districts.

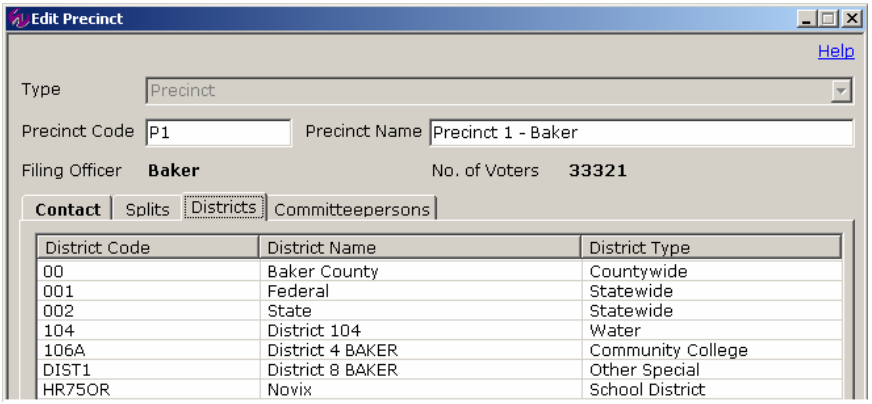


Figure 23. District Identifiers

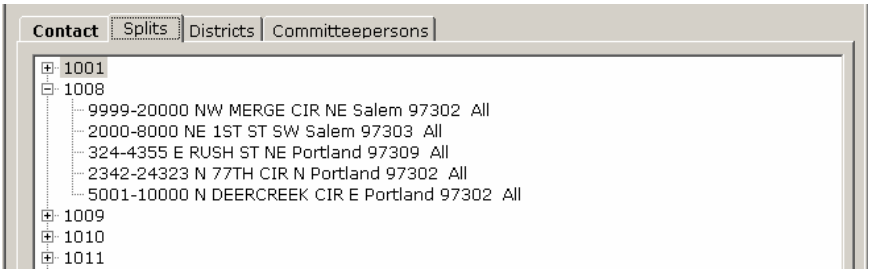


Figure 24. Split Precincts

The system has the ability to store a unique combination of districts for any split code. It also allows modifying the combination of districts for a particular split.

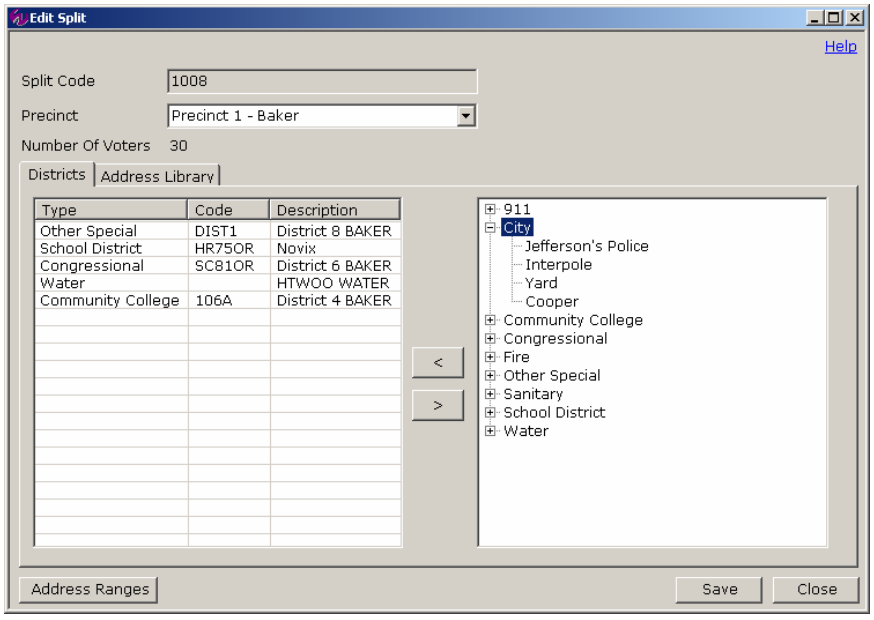


Figure 25. Editing Splits

Electus has the ability to store identifiers, in any form (including alphanumeric), for precinct, sub-precinct, split and district. The system is able to store these identifiers in various forms to fit the requirements for each county's specific needs.

The system provides the ability to re-assign voters to new precinct, sub precinct or splits and also provides the ability to assign Addresses, Street Address Ranges and precincts to a variety of political districts, including precincts, and splits.

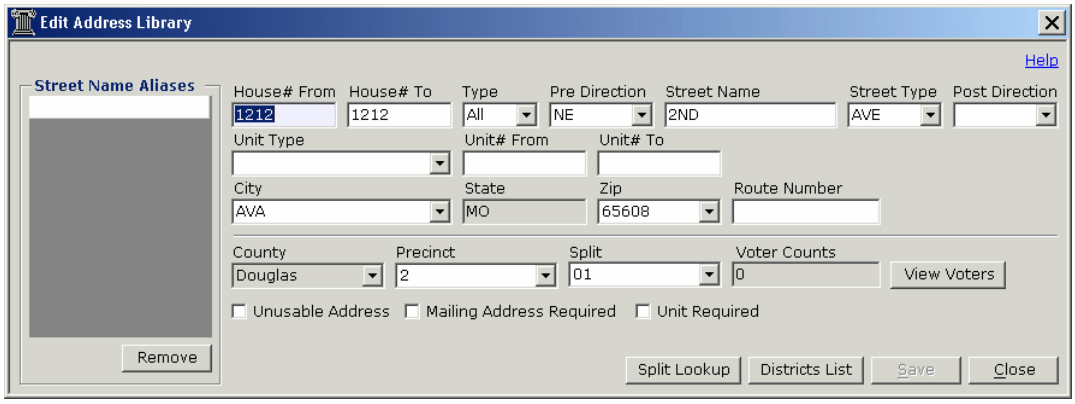


Figure 26. Address Library

Information in the districts and precincts module is integrated with and available to other modules in the system such as Address Library Management and Voter Registration and displays the accurate voter count for all qualified political parties by precincts, splits and districts in all counties in the Election Management module.

The precinct and district module has various predefined reporting and exporting capabilities. Users can select various criteria to generate reports. The system provides reports that include statistics and data regarding: Voter Counts for Districts/Precincts, Election Districts, Precincts Statistics, Precincts/District Code area Reports, Levy Code Statistics and more. The system has the capability to identify and report on all precinct combinations associated with specific districts.

The system provides the ability to generate custom reports of the entire district and precinct file.

POLK COUNTY

Jun, 22 2004

DISTRICT STATS

#	DESCRIPTION	PREC	DEMOCRATS COUNT	DEMOCRATS PERCT	REPUBLICANS COUNT	REPUBLICANS PERCT	NAV COUNT	NAV PERCT	OTHER COUNT	OTHER PERCT	DIST TOTALS COUNT	DIST TOTALS PERCT
111	CHEMEKETA COMMUNITY COLLEGE	102	264	33.42	346	43.80	167	21.14	13	1.65	790	2.18
		106	483	32.90	608	41.42	341	23.23	36	2.45	1468	4.04
		110	258	38.57	196	29.30	192	28.70	23	3.44	669	1.84
		118	1220	32.95	1758	47.48	662	17.88	63	1.70	3703	10.20
		122	216	34.07	294	46.37	108	17.03	16	2.52	634	1.75
		134	1340	34.62	1813	46.84	673	17.39	45	1.16	3871	10.66
		144	1435	34.89	1737	42.23	859	20.88	82	1.99	4113	11.32
		146	1015	33.88	1420	47.40	519	17.32	42	1.40	2996	8.25
		152	1184	30.82	1818	47.32	770	20.04	70	1.82	3842	10.58
		154	979	35.38	1202	43.44	535	19.34	51	1.84	2767	7.62
		162	1453	35.73	1734	42.64	825	20.29	55	1.35	4067	11.20
		166	286	41.33	179	25.87	207	29.91	20	2.89	692	1.91
		178	1379	34.75	1414	35.64	1090	27.47	85	2.14	3968	10.92
		182	1091	39.80	909	33.16	677	24.70	64	2.33	2741	7.55
	TOTAL FOR DISTRICT		12603		15428		7625		665		36321	100.00

Figure 27. District Report

The system provides the capability user to perform operations like creating, modifying, and deleting splits, and also creating, editing, deleting, splitting, and merging address ranges without affecting the voter's record or any other election process.

8.2.6 Election Management

Electus provides an extremely powerful interface to managing the elections. The interface provides a "wizard" like interface that allows the users to manage all of the election functions from one screen. On the left side of the wizard, the screen lists all of the functions needed to perform the election in a to-do or checklist format. The user is able to browse the various functions by clicking the function name on the list. This wizard like interface allows experienced and skilled county users the ability to see what tasks need to be completed to create or certify an Election while allowing new users the ability to learn the Elections process in a greatly reduced amount of time.

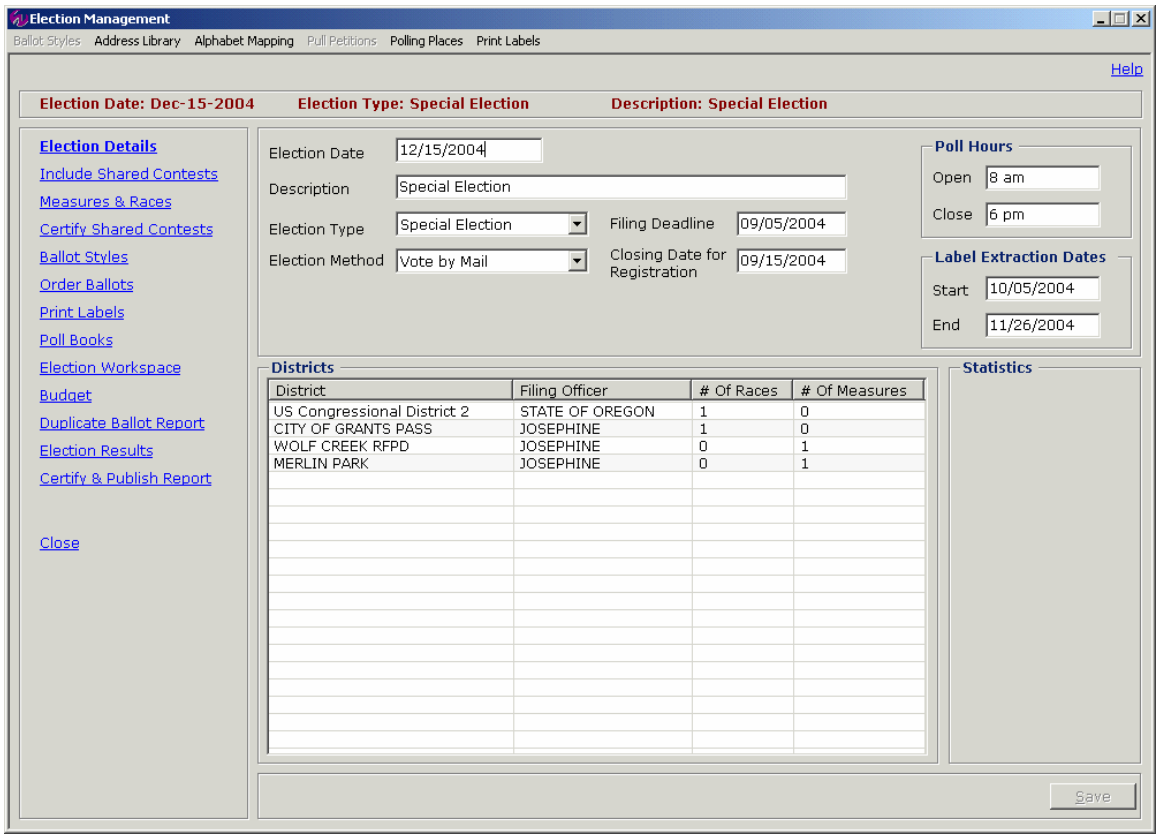


Figure 28. Election Management Interface

The system will allow authorized users to create and modify election in an easy to follow wizard like interface including:

- Election name and description
- Election Type
- Election Date
- Filing deadline for candidates

- Closing date of registration
- Polling places by precincts
- Start and End hours of polling
- Early voting sites with hours
- Start and End date of Ballot Issuing / Label Printing
- Ballot Style generation based on Offices and Measures in the election, voters involved and the political parties

The system allows authorized users to search, update, and delete elections. The query screen allows users to search the election by Election type, date, year or election and name. The system allows users to process and work on many different elections on the same workstation or on different workstations simultaneously. Users have the option of changing to different elections simply by selecting a different election from the election search screen that lists the election of the county. The system provides a wizard like interface to authorized users to create the election and provide all necessary information like contests (offices and measures), candidates, participating districts and jurisdictions, voters, ballot styles by parties and contests with an ability to input election results and run various reports.

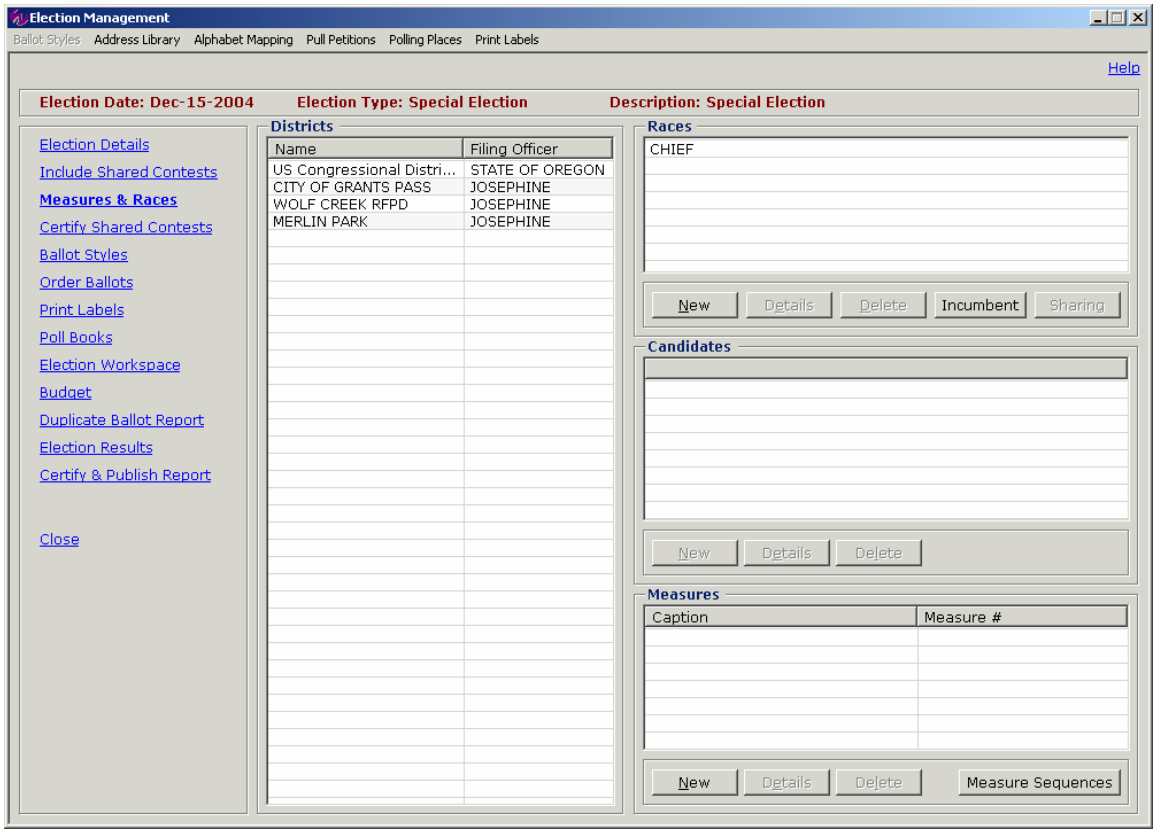


Figure 29. Election Management – Measures and Races

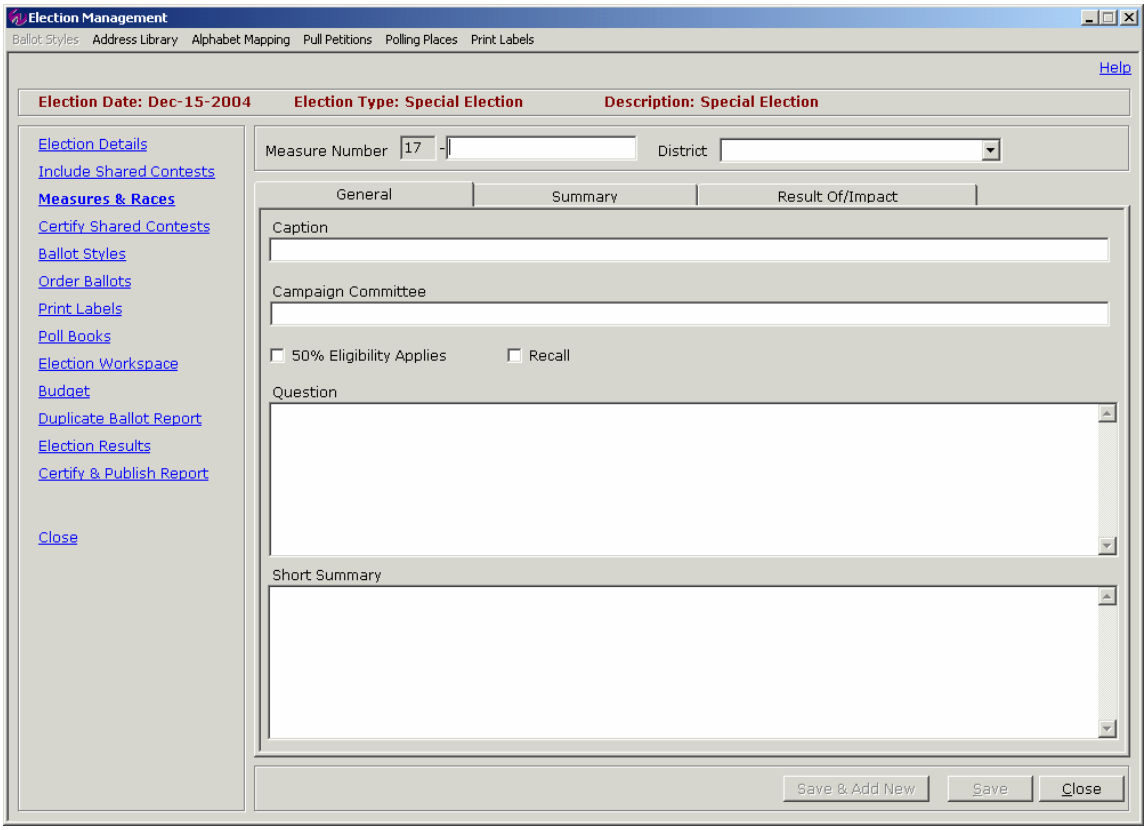


Figure 30. Election Management – Measures and Races

The system allows users to generate the ballot styles for the election based upon the races and measures, participating districts, precincts and sub-precincts (splits), and political parties. Just by clicking a button, the ballot styles can be generated that show the number of voters per style, races, and measures on the ballot.

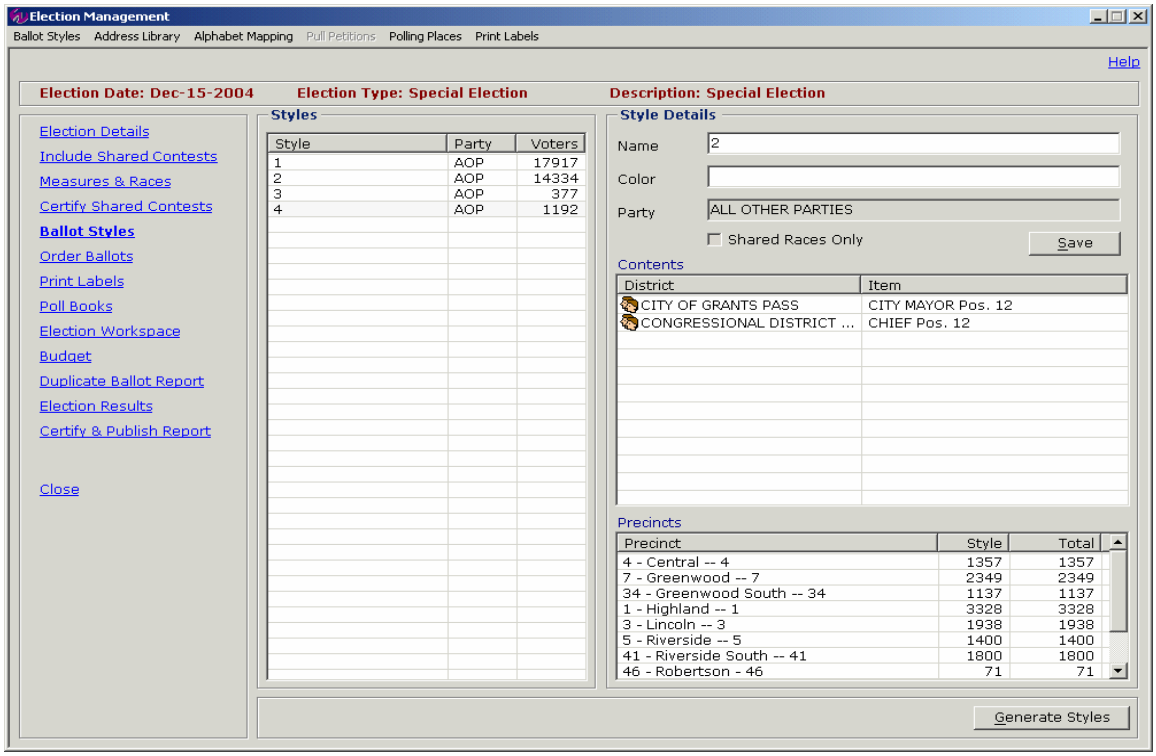


Figure 31. Election Management – Ballot Styles

The system also provides the ability to check a candidate's eligibility requirements for a particular race by just pressing a button; the system will check both System Defined requirements (such as ensuring that the candidate belongs to the correct party for a partisan election) and User Defined requirements (such as ensuring that the candidate is a citizen).

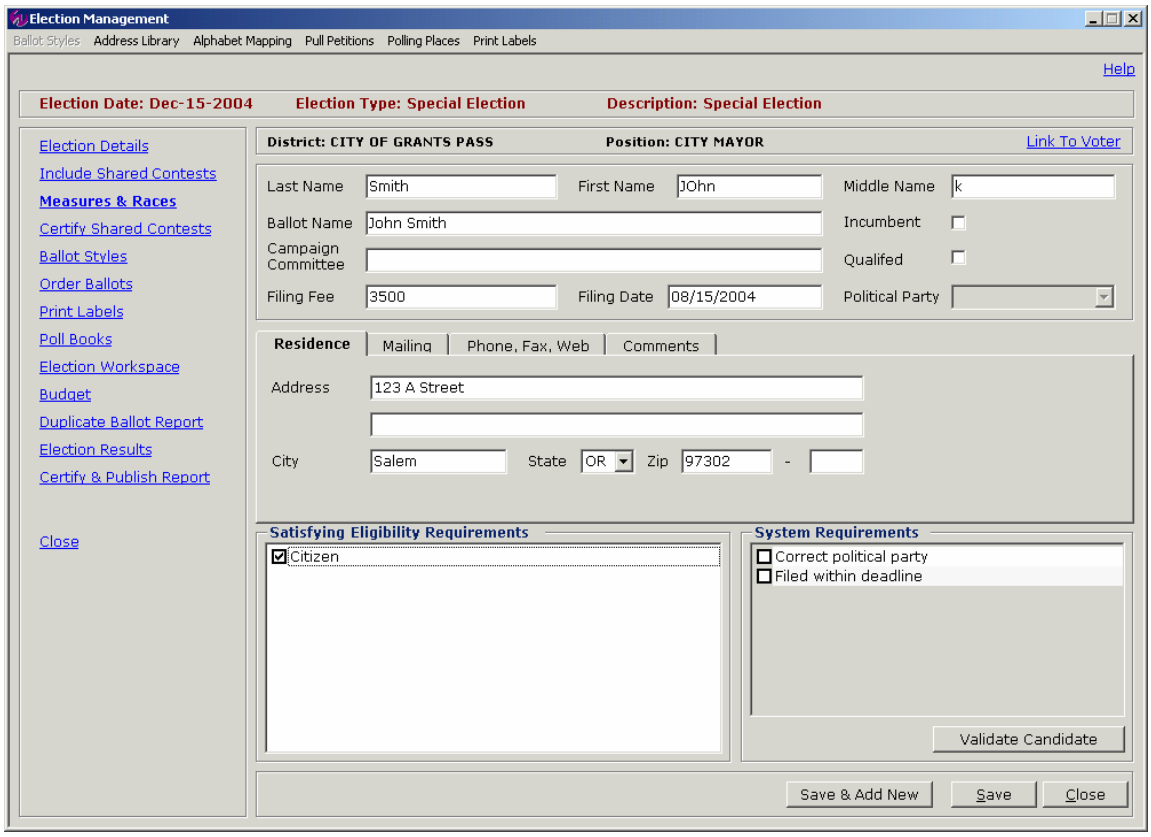


Figure 32. Election Management – Candidate Eligibility Requirements

The system allows authorized voters to generate various reports about the ballot styles, voter counts, offices, and measures on different styles of ballots, printing mailing labels in batches, election results and other election statistical reports.

County: JOSEPHINE — **Precinct Party Ballot Count** — Date : 10/17/2004

Elections : 12/15/2004 - Special Election

Precinct Code & Precinct Name	Party	Party Name	Voter Count
1000015 MERLIN PARK	CON	Constitution	4
	DEM	Democrat	373
	LIB	Libertarian	23
	NAT	Natural Law	1
	NP	Non Partisan	322
	OTH	Other	23
	PAC	Pacific Green	2
	REF	Reform	1
	REP	Republican	626
		Total :	1375

Figure 33. Precinct Party Ballot Count

The system allows authorized users to view and define polling locations for the precincts. Upon election certification, the system will push all the ballots information to respective voters' accounts that would include the type of ballot, voters' eligibility, and status (accepted, rejected, etc.) for the election.

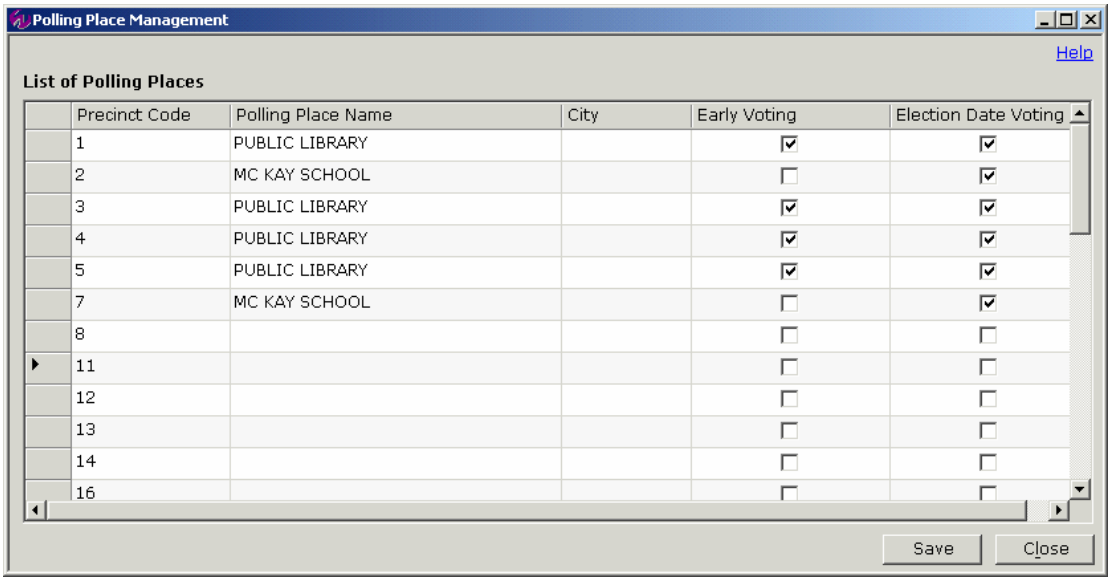


Figure 34. Polling Place Management – List of Polling Places

The system provides the authorized users to capture the voting information of the voters from different sources like poll book, early voting records, and absentee ballot files. Currently the system supports the processing the ballots through input files (from wand readers or other similar units), and single mailed ballot processing as well as through the batch scanning of barcoded poll books wherein the system automatically recognizes whether a signature is present in a specific voter's signature block to provide an immediate "tentative" voter count for the election. This ability also prevents a duplicate ballot from being cast.

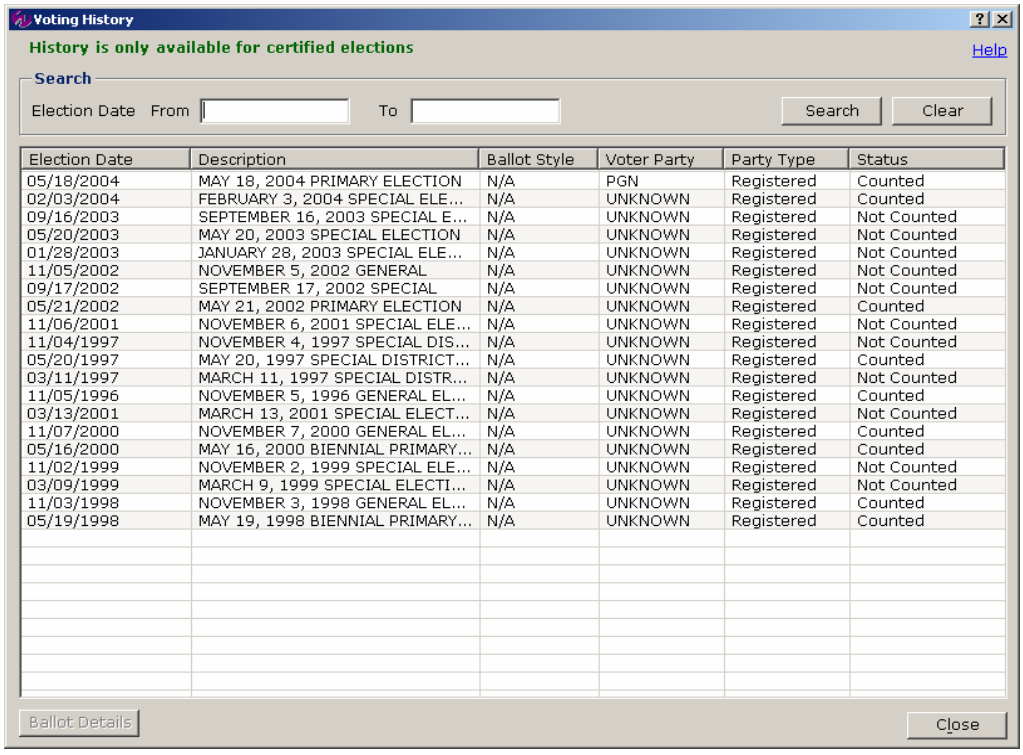


Figure 35. Voting History

The system allows authorized users to define and update the offices (positions) and elected officials (position holders) that is readily accessible through the system for districts to which the office belongs. The office details included Office terms, start year, party affiliation(if any) number of positions, type of election the office goes on ballot and eligibility requirement checklist for the candidates. The Elected official (position holder) details include Name, Start and end date, political party, contact info like phone, email, website, and addresses.

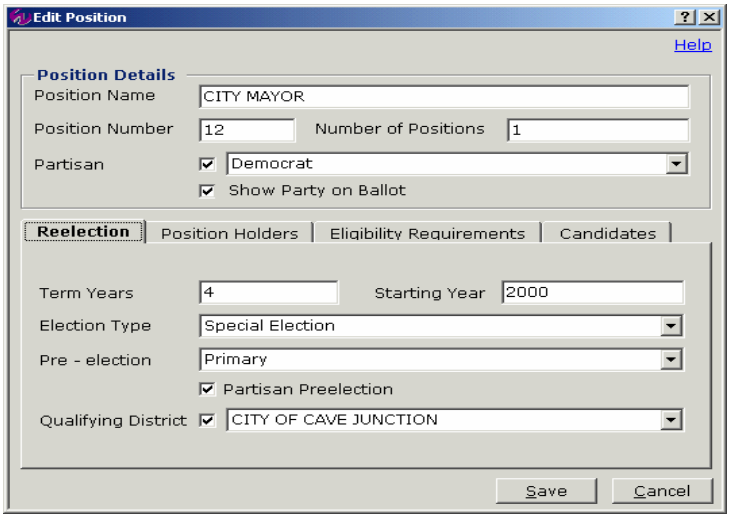


Figure 36. Position Details

8.2.7 Absentee Management

Electus allows multiple absentee addresses with different date ranges as part of the voter record. The applicable address according to that date range is then used for mailing ballots in an election.

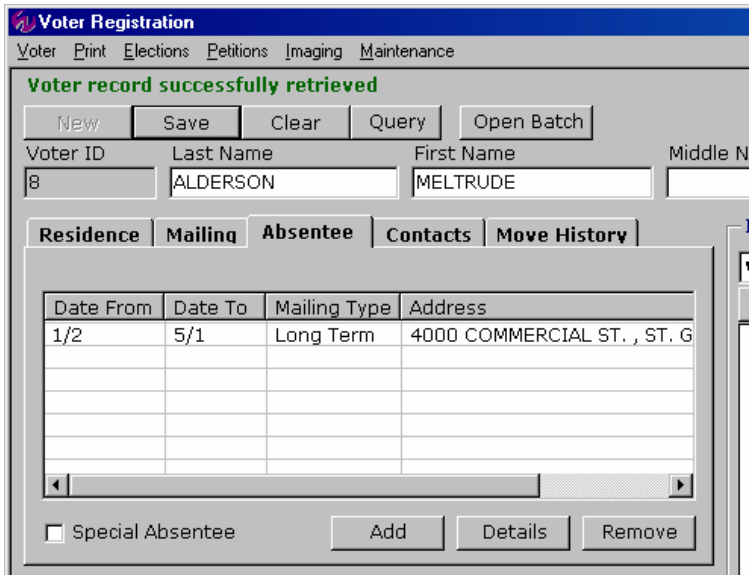


Figure 37. Absentee Voter Registration

Electus allows for multiple absentee addresses for a voter based on a date range. Electus uses an Address Type designation for this purpose. The Address Type is assigned to the Absentee Address and is used to produce ballot labels at the appropriate time. A user with the appropriate security privilege can maintain the Address Type values.

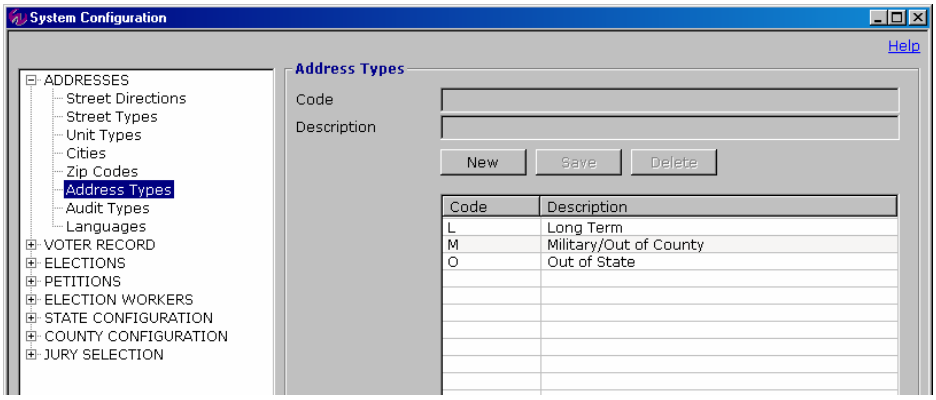


Figure 38. Absentee Voting – System Configuration

All ballot mailings and receipts to and from the voter are logged and tracked using the various modules in the system, such as creating ballot labels in the Election Setup module and processing received ballots in the Ballot Processing module. Electus produces ballot labels with identifying barcode information. Labels can be printed using a variety of selection criteria.

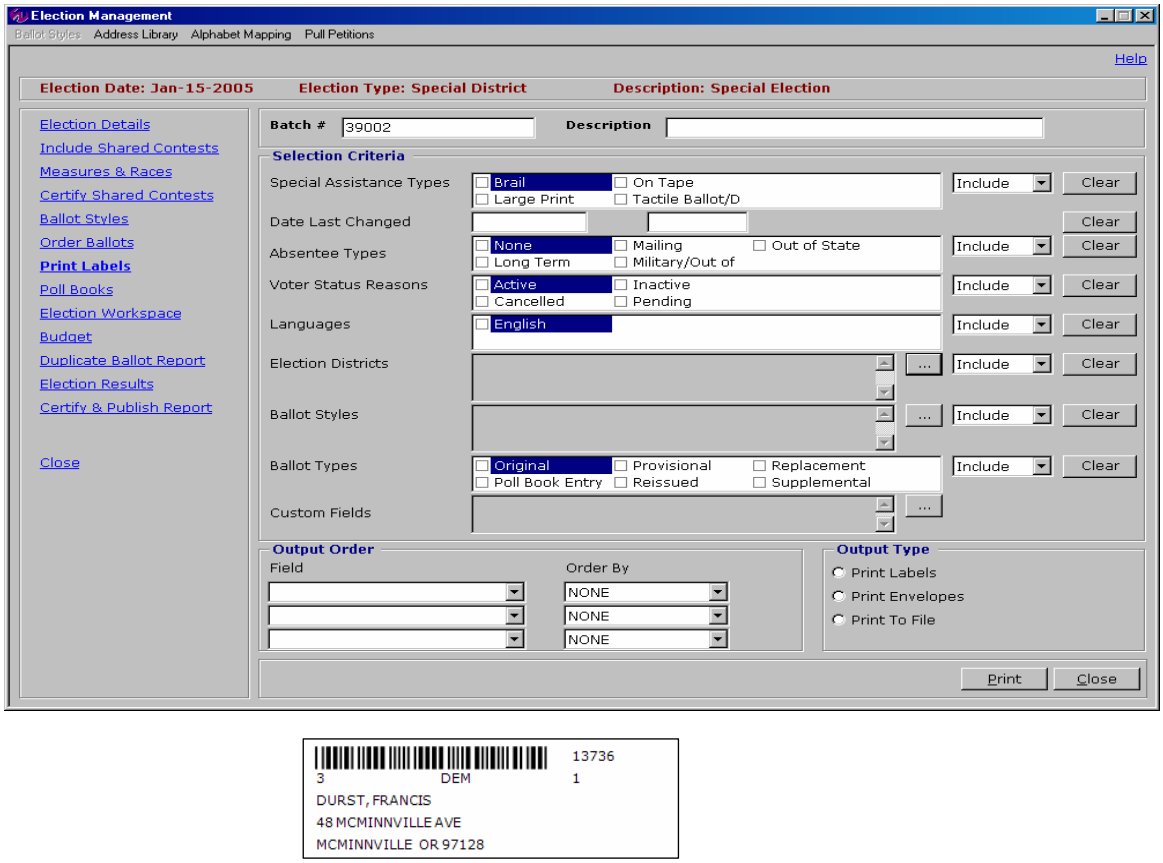


Figure 39. Label Printing

Electus provides a Replacement Ballot feature in the Voter Registration module. Replacement ballots are logged in the Election Workspace and are verified when any ballot for voter is returned.

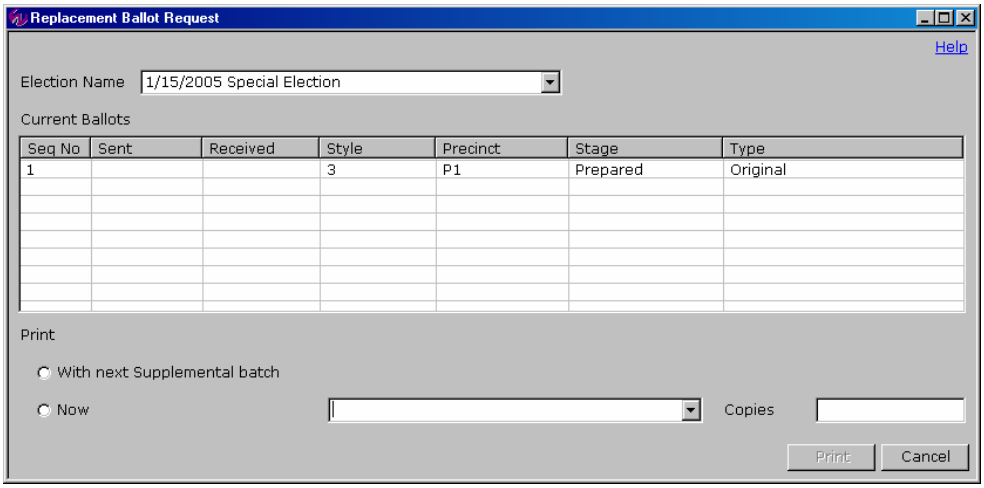


Figure 40. Replacement Ballot Request

8.2.8 Ballot Processing

Electus provides a Ballot Processing module for handling absentee and returned ballots. This module allows for the creation of any number of batches. Each batch can be created manually or scanned using a wand unit and then uploading the text file into the system.

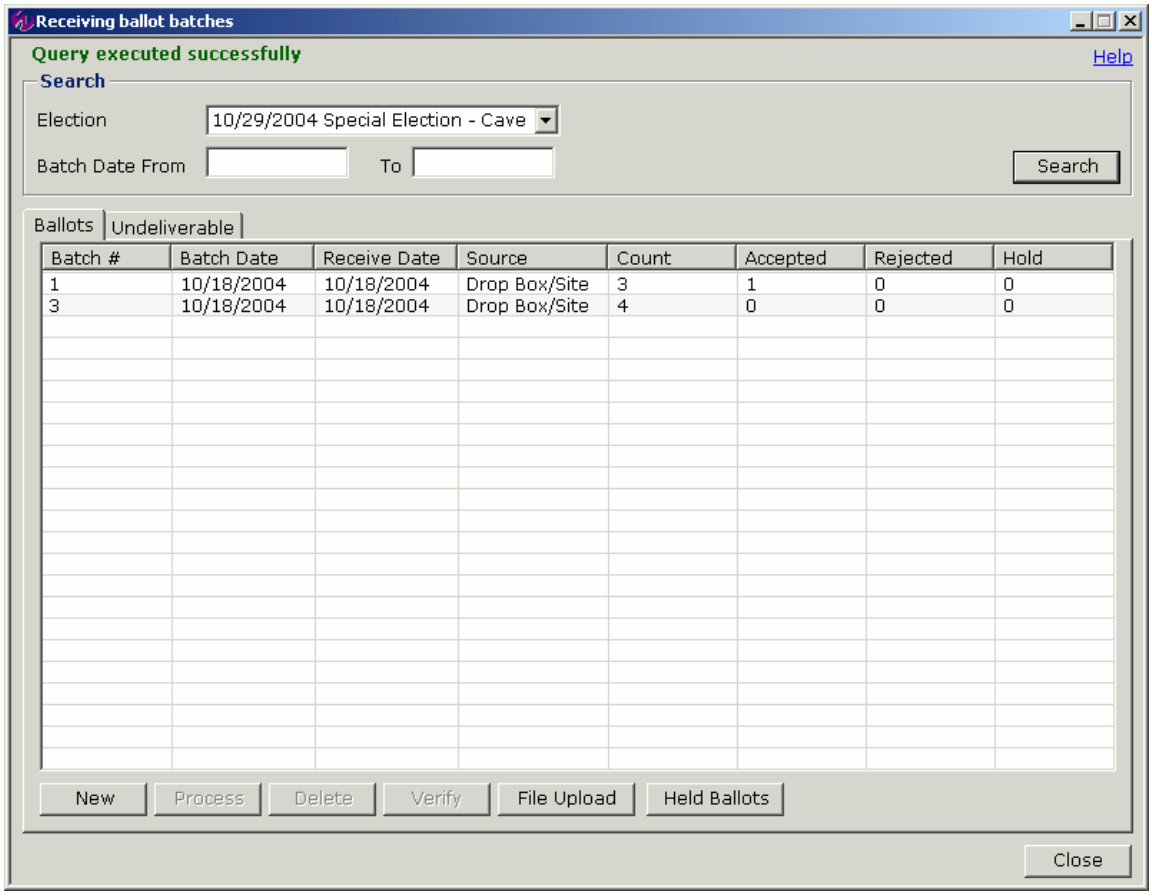


Figure 41. Receiving Ballot Batches

The system has the ability to produce and read bar coded information specific to an election ballot. This barcode includes all of the information necessary to identify the voter, ballot style, and any other information needed to identify the ballot. When this barcode is read using the ballot processing functions of the system, either in batch or single mode, it will record an entry in the Voting History identifying the ballot label that was received. Any exceptions (such as duplicate voting) during ballot processing are clearly identified on the screens as well as providing county-specific (which can be set up by the county administrator) on how to handle the exception.

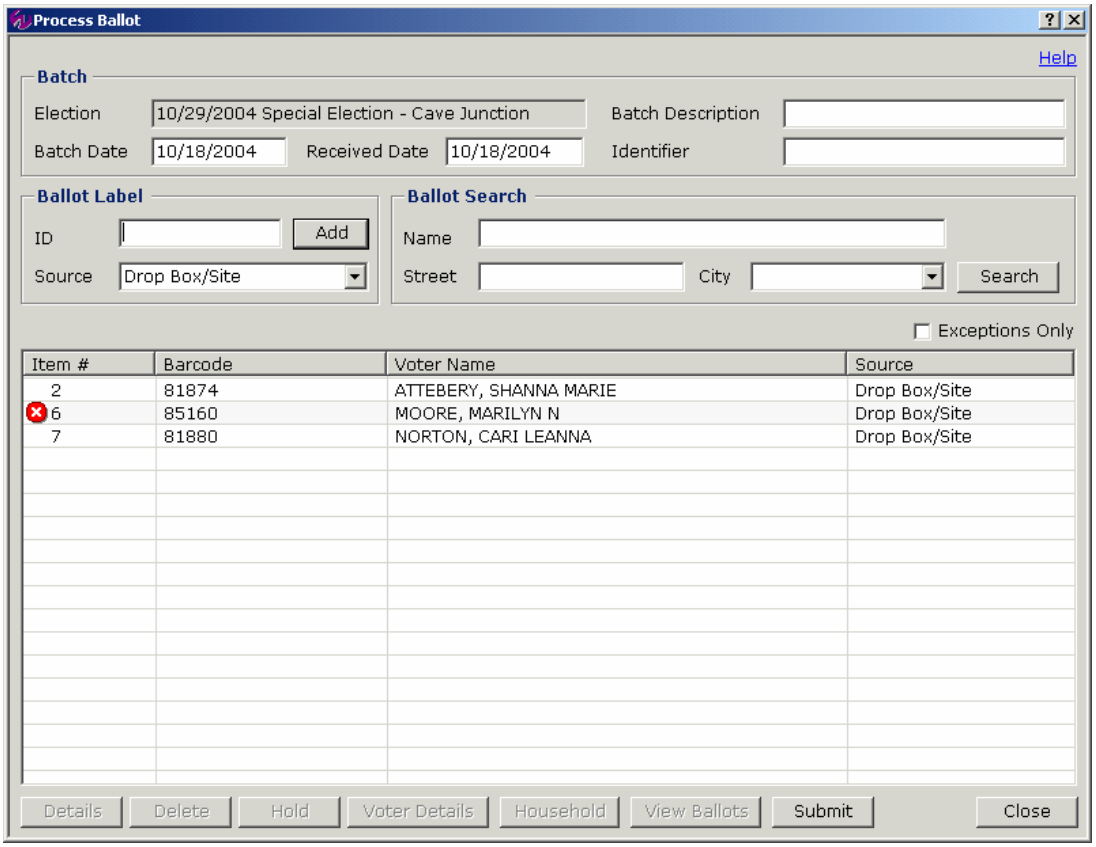


Figure 42. Process Ballot

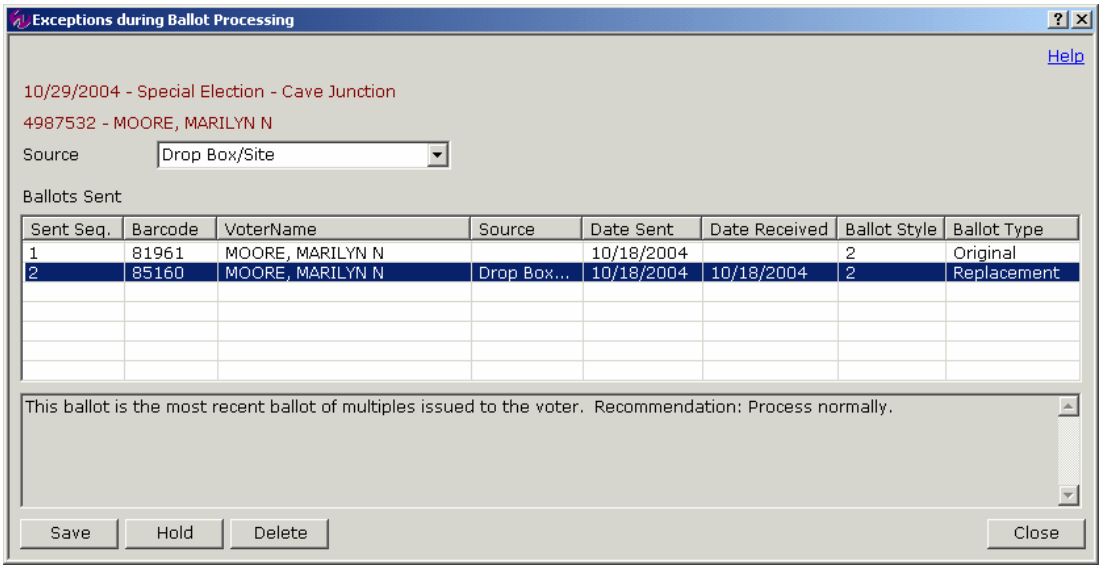


Figure 43. Exceptions During Ballot Processing

Electus allows for rapid processing of received ballots including a single screen interface for displaying the appropriate voter's signature for comparison with the poll book or absentee ballot signature.

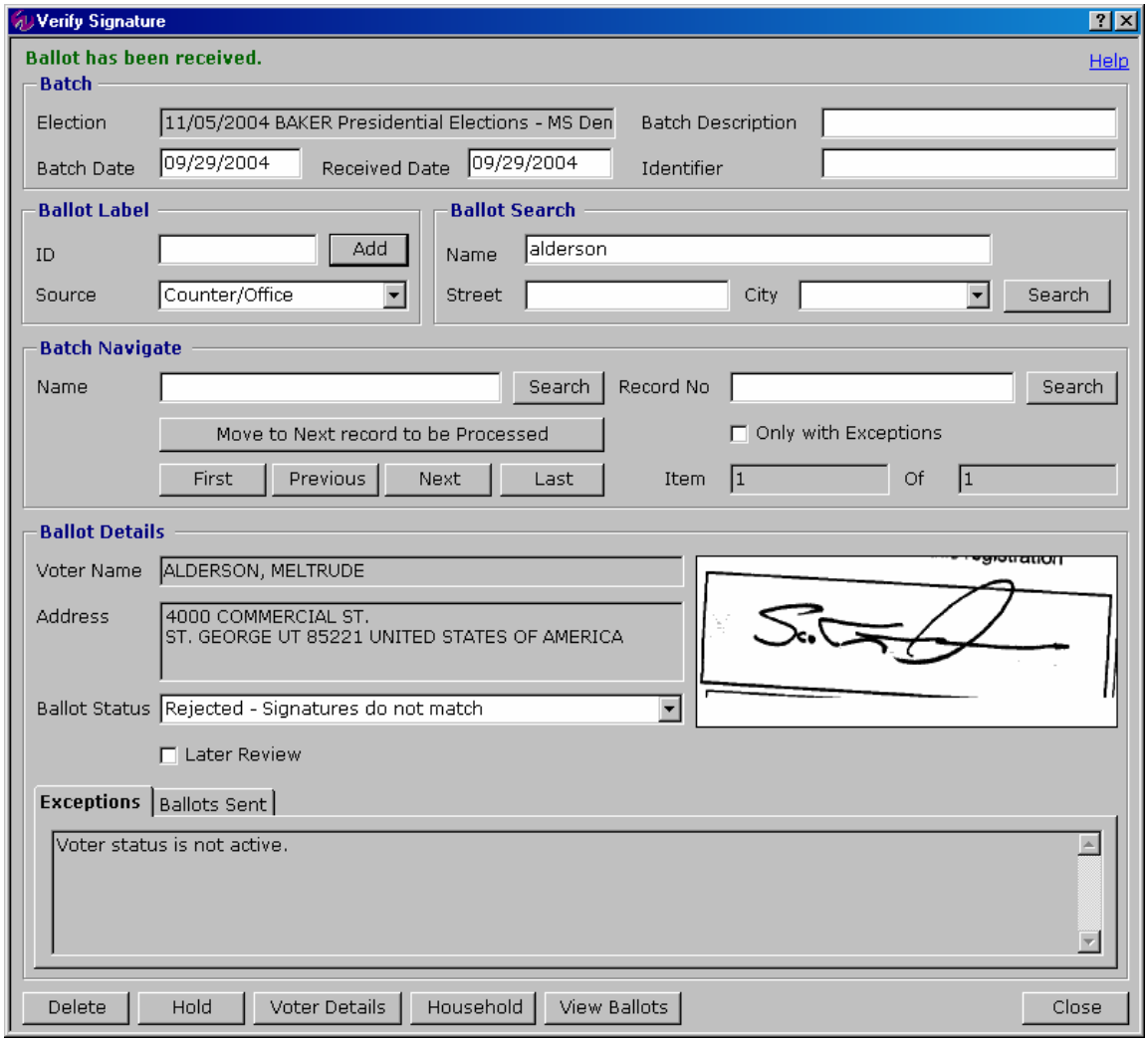


Figure 44. Signature Verification

8.2.9 Petition Management

Electus comes with a comprehensive Petition Management System. The primary Petition Management screen is shown below, followed by the primary features of this module.

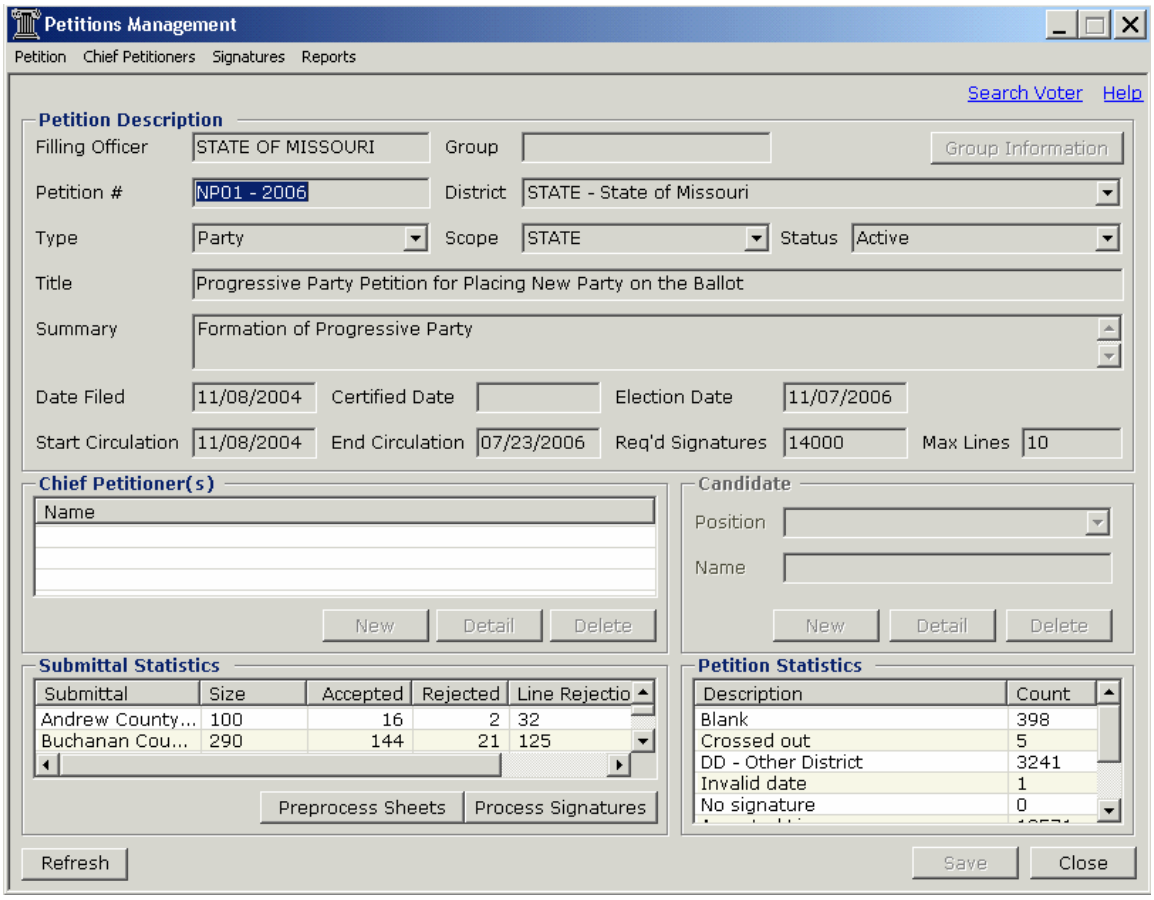


Figure 45. Petition Management

Primary features of the Petition Management module include:

- The ability to manage and check petitions for petitions of type initiative, referendum, recall, and candidate.
- The ability to setup a petition for the checking process with information including the petition number, a brief text description of the petition, the petition received date, the circulation start date, the circulation end date, and the valid jurisdiction for that petition.
- The ability to setup a petition for the checking process with the number of signatures submitted.
- The ability to specify the number of signers per page.

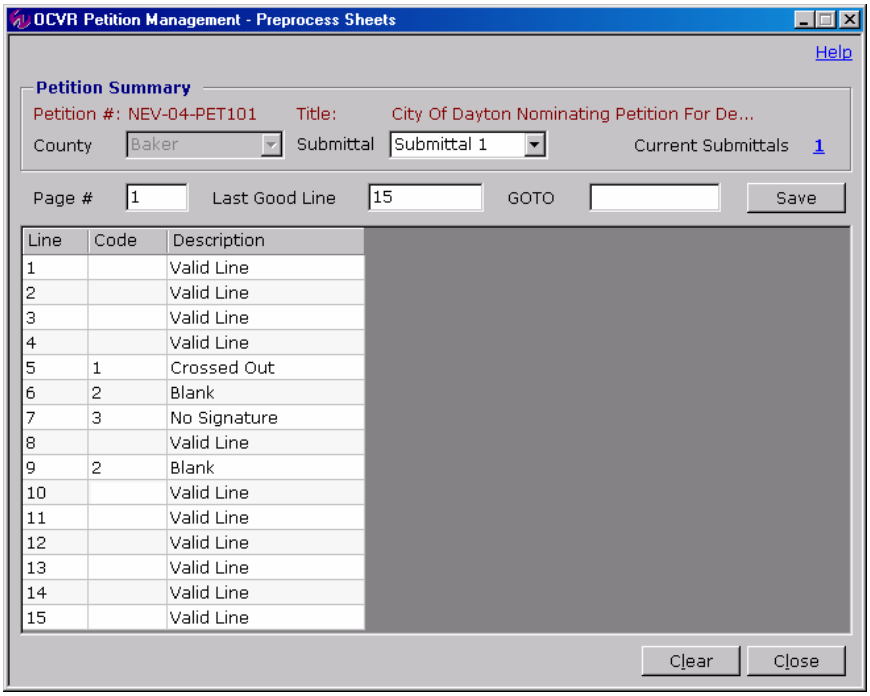


Figure 46. OCVR Petition Management – Preprocess Sheets

- The ability to generate samples through a procedure to select signatures to verify.

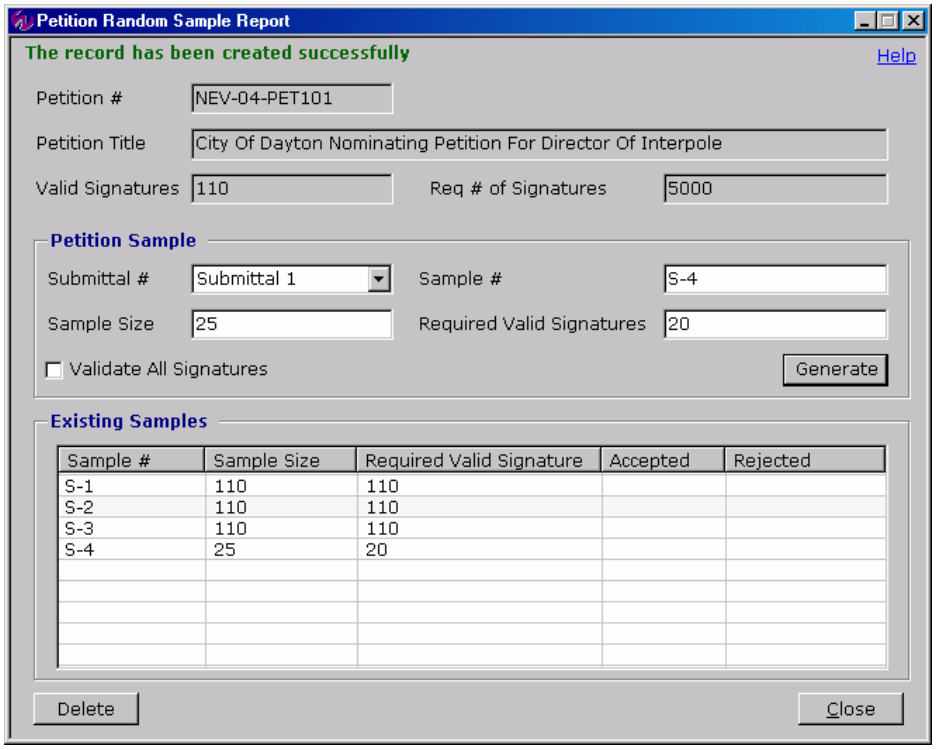


Figure 47. Petition Random Sample Report

- The ability to enter chief petitioner information such as name, address, and phone information.

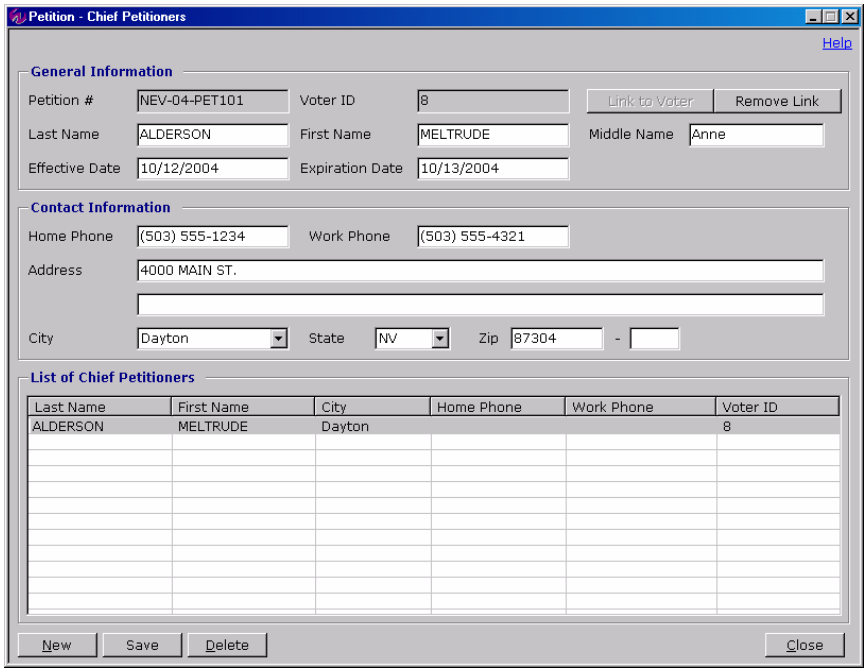


Figure 48. Petition – Chief Petitioners

- The ability to add/generate additional new samples for a submittal so that users can increase the size of a submittal is available until processing of the petition signatures has begun. After processing has begun, Electus allows users to add single petition lines to a sample increasing the size of the sample without having to recheck the petition signatures that are already checked.

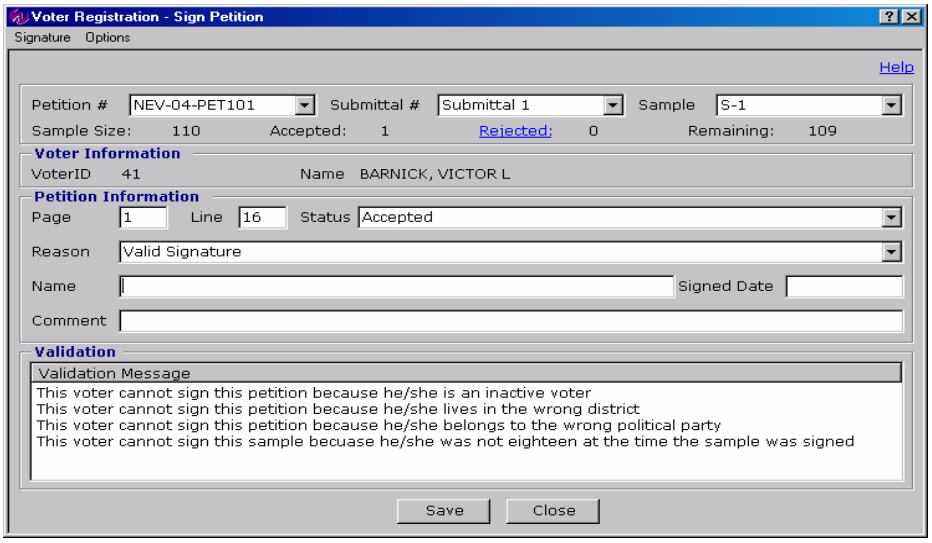


Figure 49. Sign Petition

- Electus provides authorized users in a county election office the ability to record in a registered voter's record an indication that the voter has signed a specific petition.

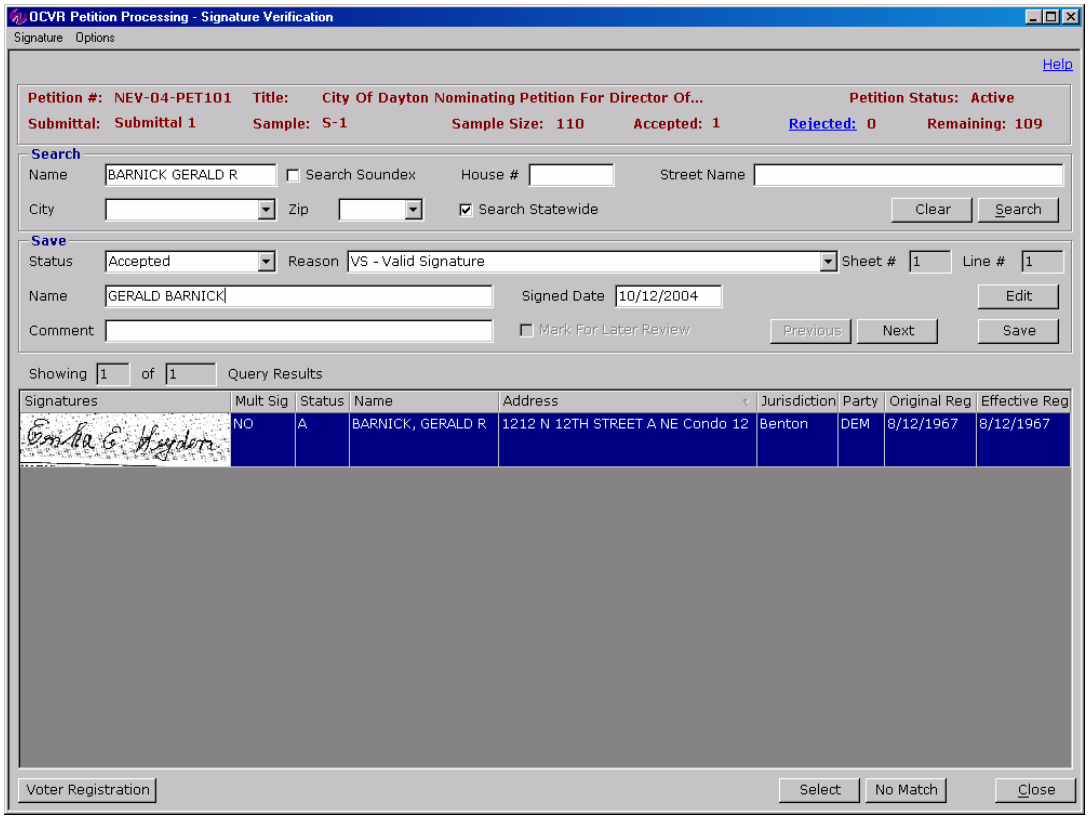


Figure 50. OCVR Petition Processing – Signature Verification

- Electus indicates if the voter has already signed the petition through screen prompts and alerts to the user.

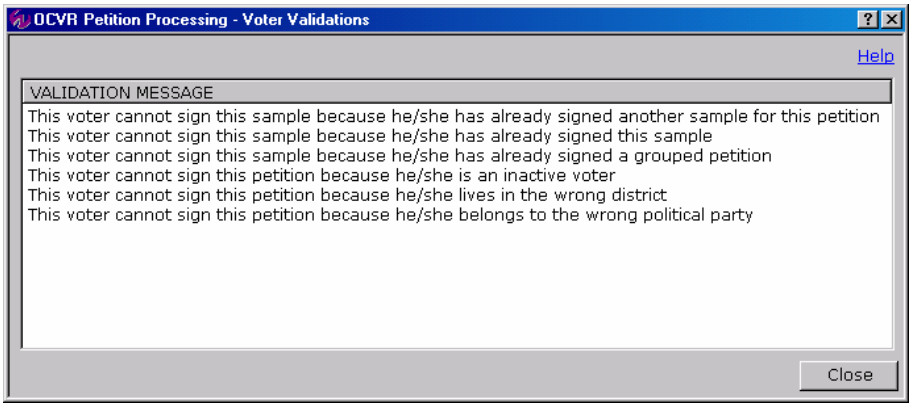


Figure 51. Voter Validations

- Electus also provides the ability for users to enter a notation that a signer has requested to withdraw a signature from a petition and to have that displayed during the signature verification process.

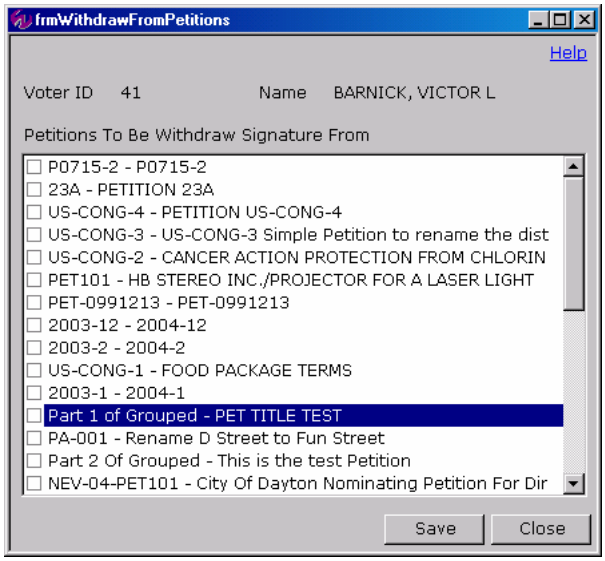


Figure 52. Withdrawing Signatures from Petition

- Electus provides authorized users the ability to view the date of registration, name, address, digitized signature, confirmation of registration status, the effective date of the digitized signature image, and qualified district for petition signers and candidates by petition.
- Electus provides authorized users the ability to accept or reject petition signatures during the verification process and record the reason for each rejection.

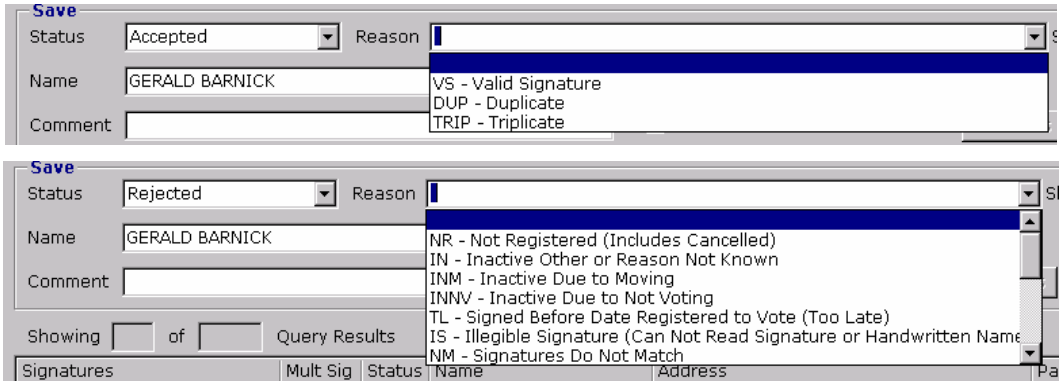


Figure 53. Accepting/Rejecting Signature

- Electus provides the ability to produce a selection of pages and lines to check for random sampling of signatures on any selected petition as required by county election officials.

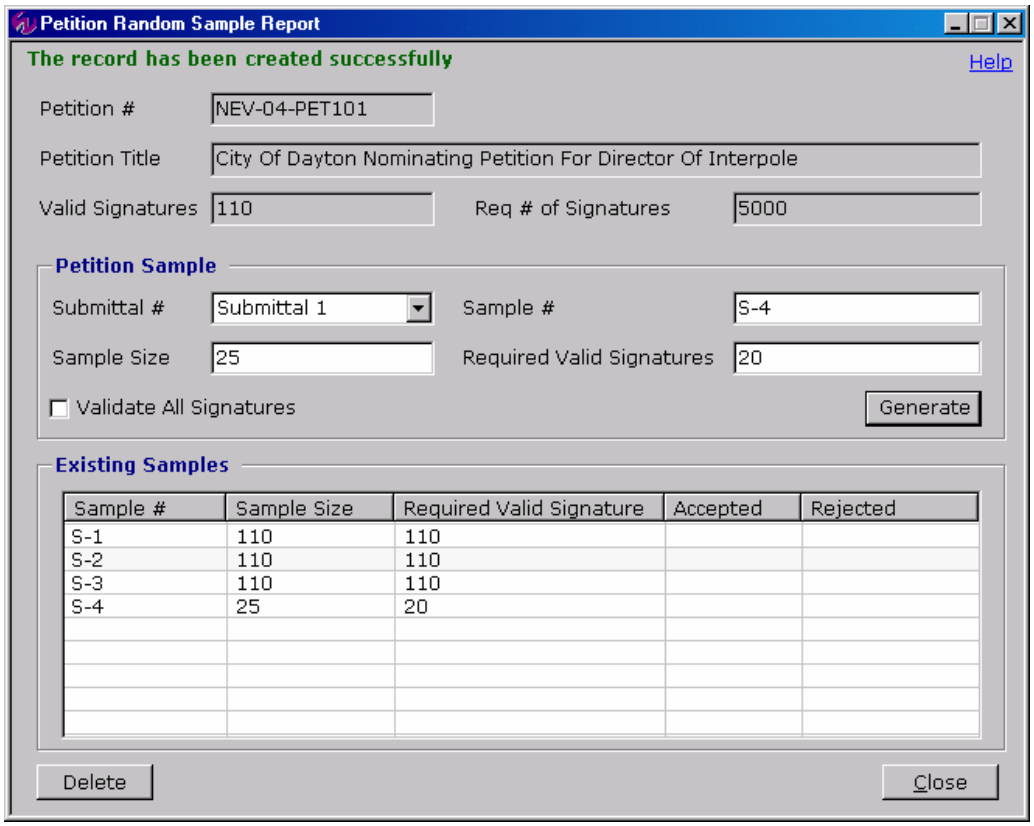


Figure 54. Petition Random Sample Report

8.2.10 Election Workers

Electus comes with a powerful election/polling workers and job management module that fully integrates with the voter's registration module. Each worker record can be linked to an existing voter record or they can be a stand-alone record so that the worker does not necessary need to be a registered voter. The worker records are managed under each county (or jurisdiction), and authorized users are capable of searching and viewing the workers' record of entire state.

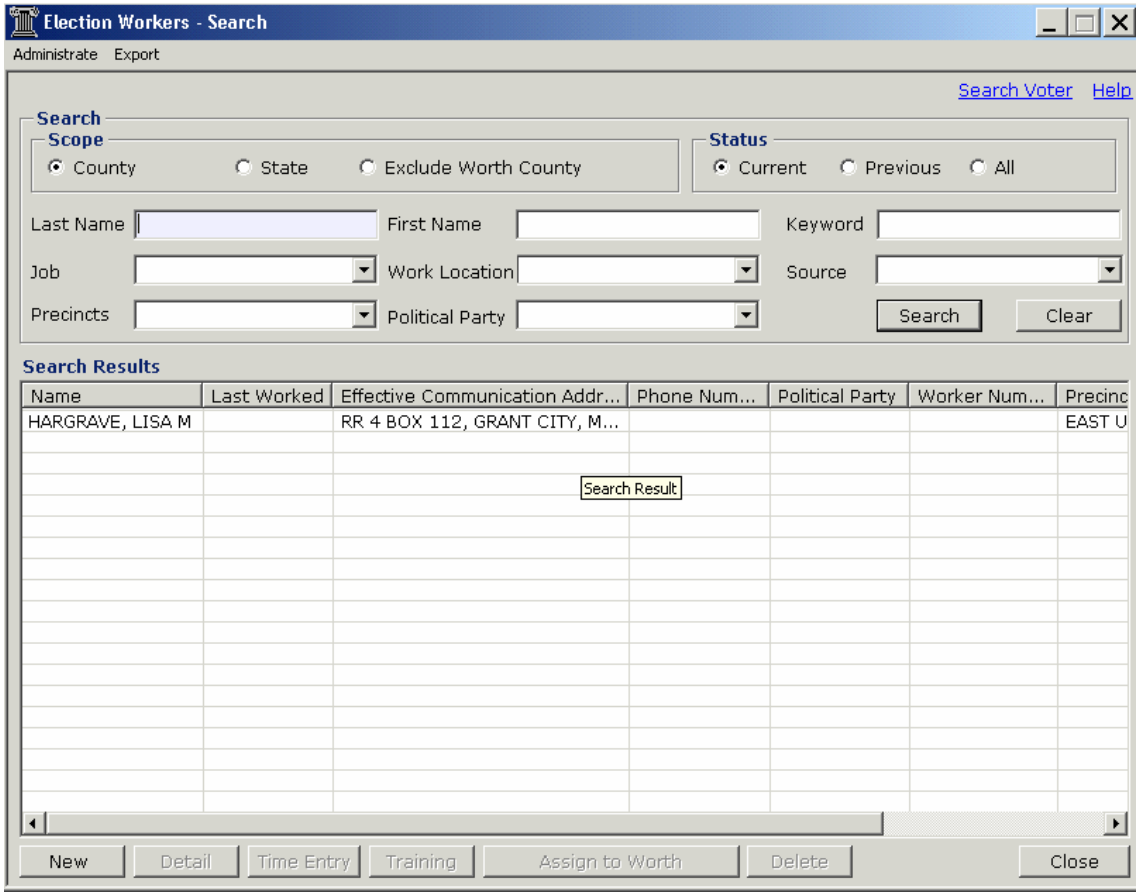


Figure 55. Search Election Workers

The module provides complete record management functionalities of individual workers that include automatic record management of their work history in different counties they have worked in the past. Optional fields of "Regular Location" and "Regular Job" can be assigned to a worker that indicates their preferred work and location assignment that does not limit the worker to work on the specified job/location. In addition, the system automatically tracks the last worked date of the worker. From this screen, authorized users can view and mange the worker's trainings, as well as their work time entry that can be tracked back to years of record.

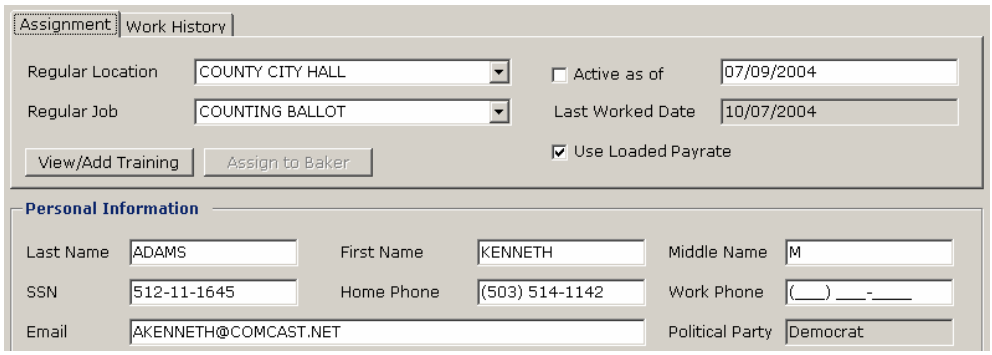


Figure 56. Election Worker Detail Screen

A key feature of the module is to be able to integrate worker information to the existing voter registration records. Linking a worker to an existing registered voter's record is a powerful but user-friendly feature that expands the capability and functionalities of the record management.

Once the worker is attached to a voter, the system will automatically update the worker's registered information such as their address and political party. The record can be treated the same way for a linked voter and workers who are not registered so that authorized users can easily manage all the records.

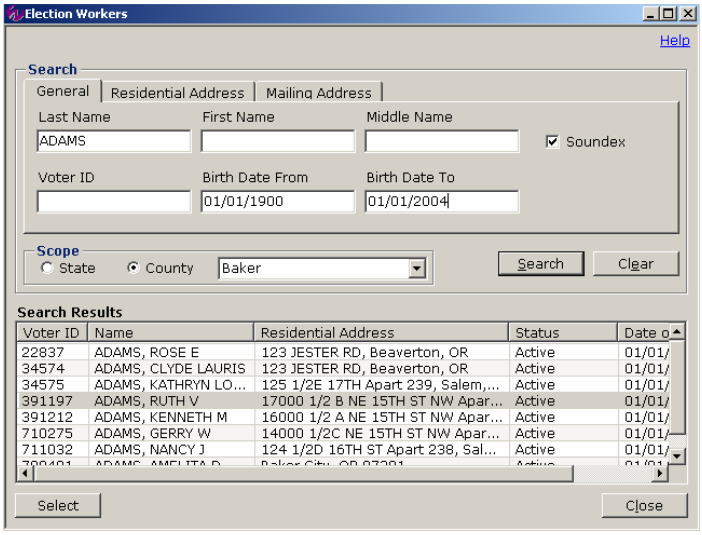


Figure 57. Election Worker Records

Worker records are maintained throughout the lifetime of the worker, and the module is capable of automatically keeping track of and individual's history. When a voter moves from one location to another, the system automatically tracks the record as "work history."

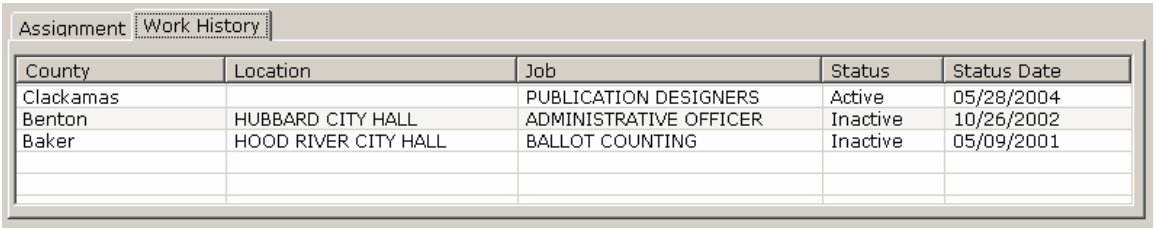


Figure 58. Election Worker History

Users can create various reports regarding workers hours, payroll information, mileage and training cost and the can be printed or exported to electronic files including XML format. The output format can be customized so that specific needs for transferring data to payroll programs can be performed without re-entering data.

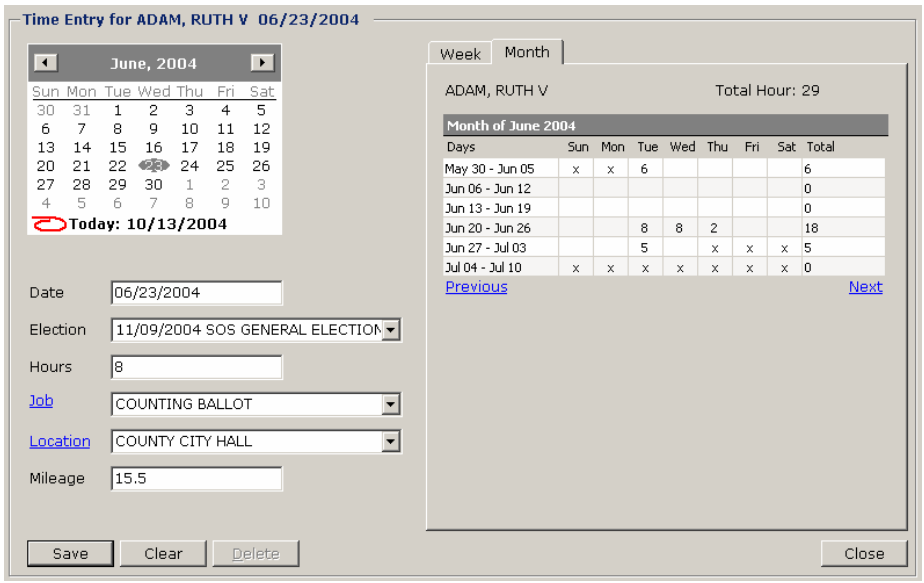


Figure 59. Time Entry Management

Training information is tracked and maintained for each worker so that user is able to view a list of trainings done for a particular worker. Each training record is also specific to existing elections so that the training cost can be used to calculate cost of each election. Comments can be attached to each record for any additional information. The Elections Workers module provides the ability to expand the current list of fields to accommodate more detail information such as class attendance, assignments, and test results.

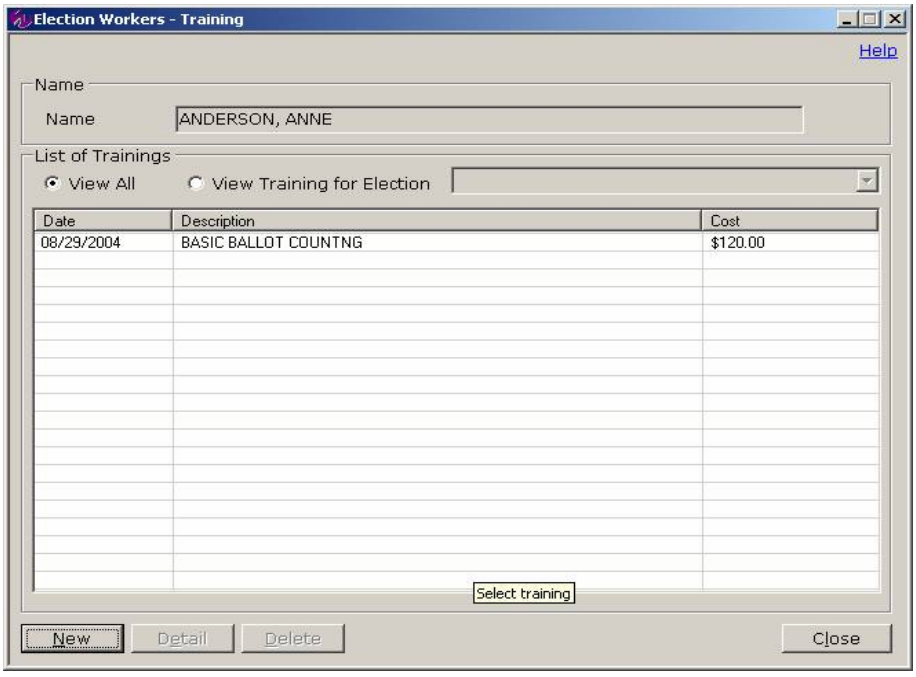


Figure 60. Election Worker Training Record

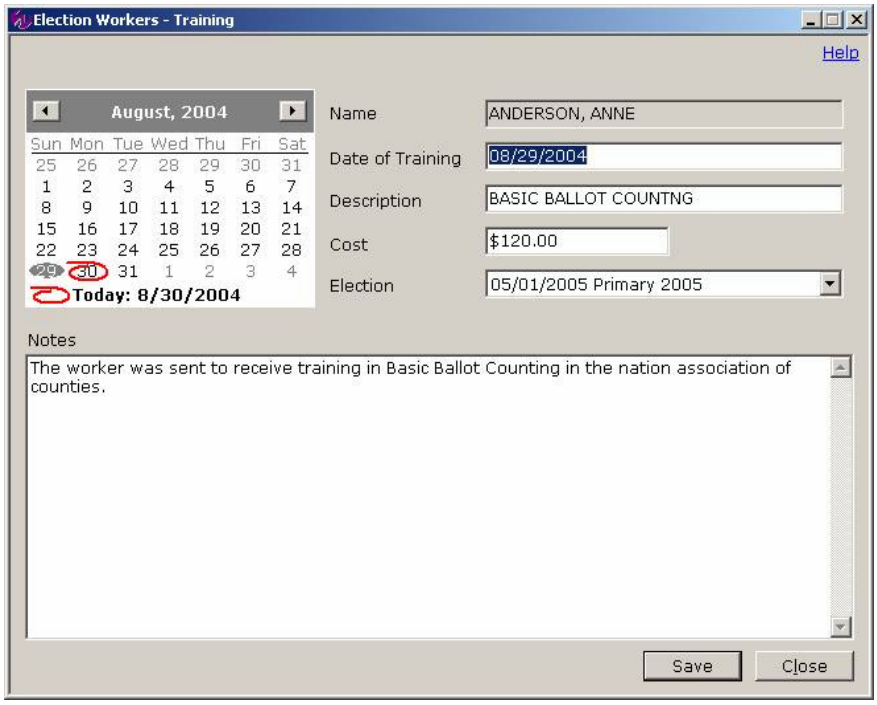


Figure 61. Training Detail Screen

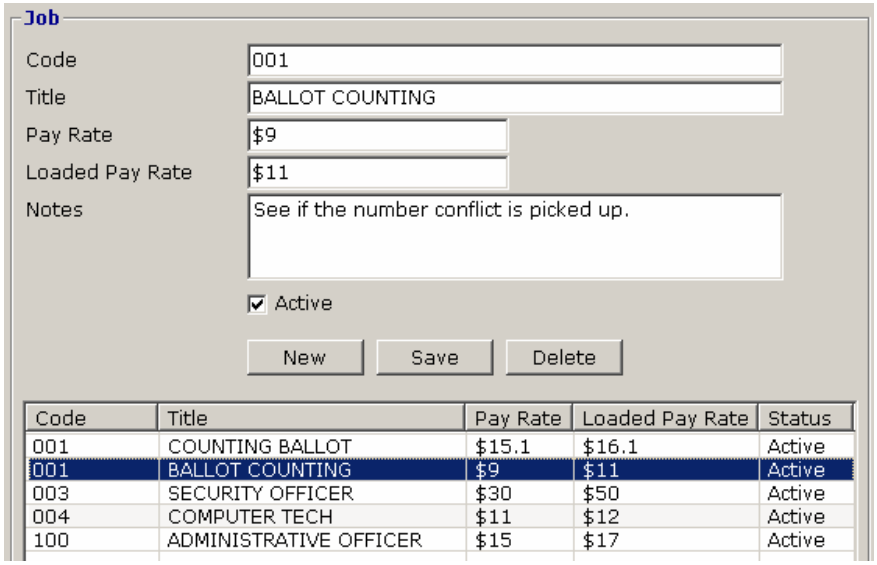


Figure 62. Election Worker Job Detail

The Jobs and Location Management screens of the module provide the capability of maintaining detailed information with regard to where and what elections workers are assigned to do. Workers can be searched by these jobs and locations that they have been assigned in the past.

8.2.11 Polling Places

Electus is equipped with powerful management features for locations and polling places. Polling places are treated as sub category of locations so that location records do not limit to only polling places. The Location module is fully integrated with existing records and functionalities of the Election, Voter Registration, and Election Worker modules. Once the location and polling places are defined and assigned to precincts using the user-friendly interfaces, the election management module integrates the information from voter registration records to populate and mange ballots and various other notifications to be sent out to the voters.

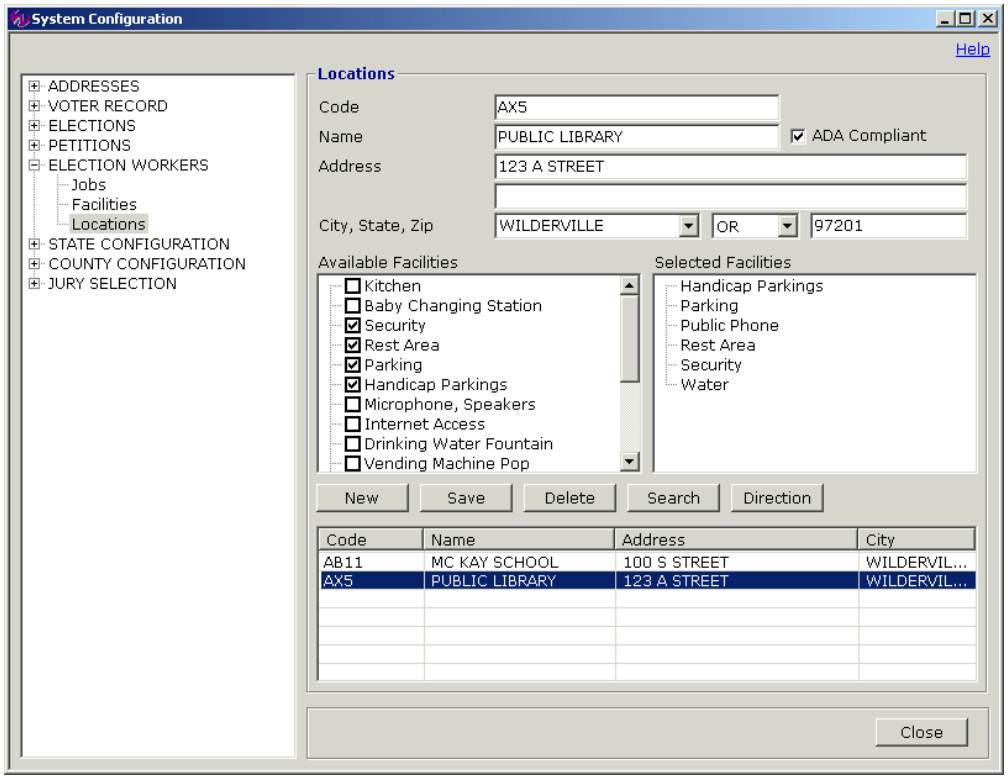


Figure 63. Location Management

Authorized users can add, delete, and modify location records by accessing to the location module. Once the records have been defined, they can be assigned as a "Default Polling Place" to existing precincts where these values are automatically populated for elections' ballot styles. This powerful automation process is done to accommodate ease of use to the user; however, these values can be dynamically customized for each election if any changes need to be made to specific changes. Facilities provided at each location can be managed using system configuration.

Among all other search and sort features of the location module, records can be queried for the past activities used for elections. The result records can be sorted based on the date, election name and precinct as well as other regular sorting fields that are equipped in the module so that historical records can be retrieved by authorized users at anytime.

Locations can be searched per election, precinct, or other detail information such as city, zip code and ADA Compliance. If the location is declared as a polling place, the system allows the authorized users to search for the records based on election and precinct.

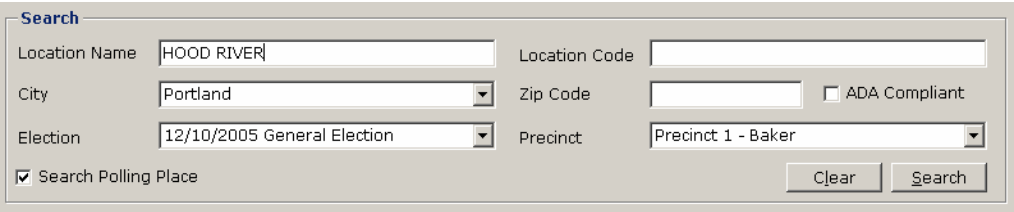


Figure 64. Search screen for locations and polling places

The polling places assigned to elections have additional information about early voting and election date voting. These values can be maintained per location for each election after the system automatically assigns default polling places to an election for its ballot styles.

8.2.12 Query and Reports

The system comes with an extremely powerful search engine that enables users to perform comprehensive searches. The query screen allows the users to include any number of search parameters into the query, customize the output of the query, and be able to save the query in their own profile.

The query module is capable of extracting the query resulting records into a text file while controlling the selection and the sort order of the output fields. Among the many other fields that can be searched, the system is capable of searching the comments fields. The users can browse the details of the resulting set of records without having to re-execute the query.

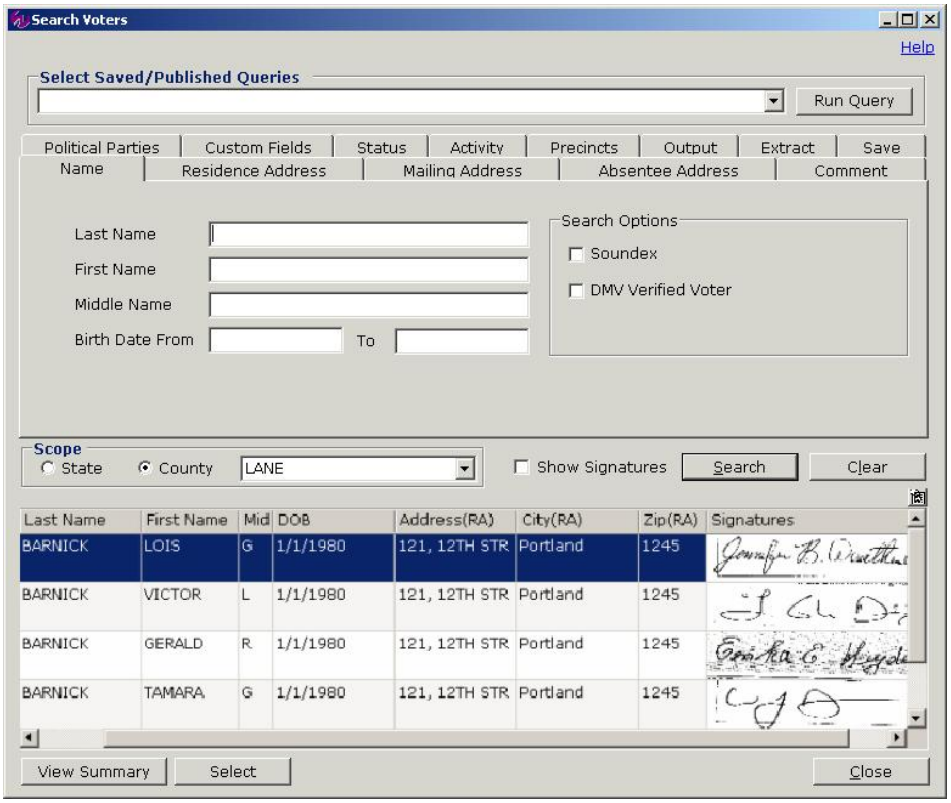


Figure 65. Search Voters

The following screens show the various query fields of the module:

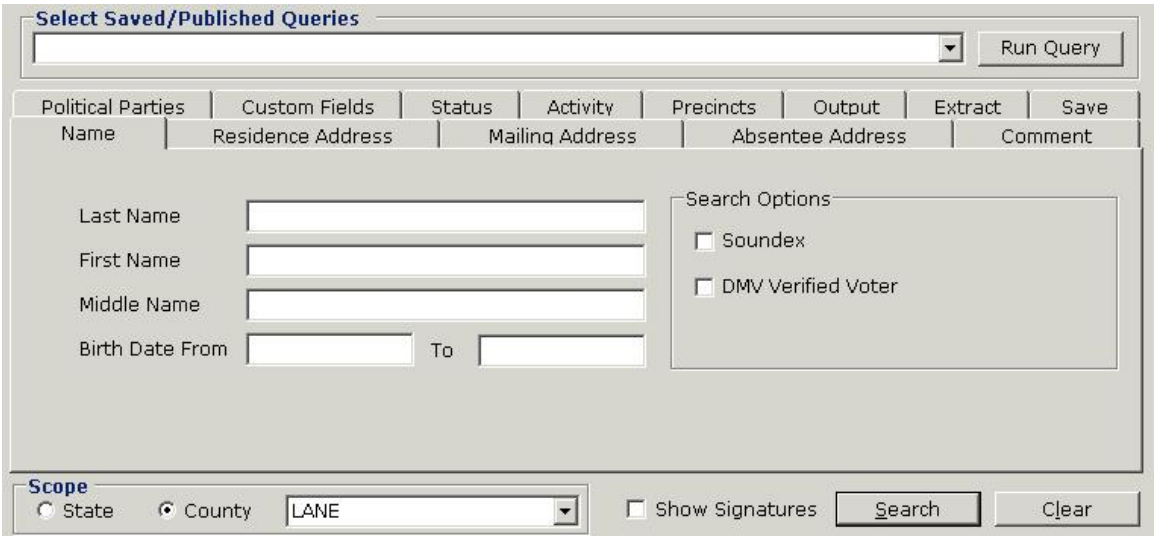


Figure 66. Name & DOB Search

The voter query module has the following features:

- Phonetic searches. Ability to search in the name field for names that sounds like the entered name (Soundex)
- Search in the county or statewide
- Ability to show signatures in the results.
- Ability to search in alternate and primary names
- Ability to easily navigate between the query results and the voter details screen without the need to re-run the query.

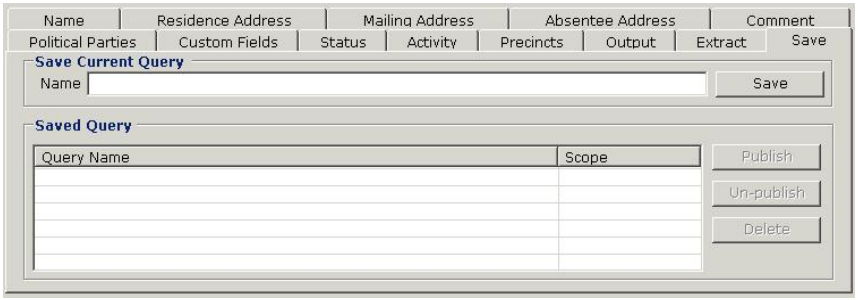


Figure 67. Ability to Save Queries (and publish to the county)

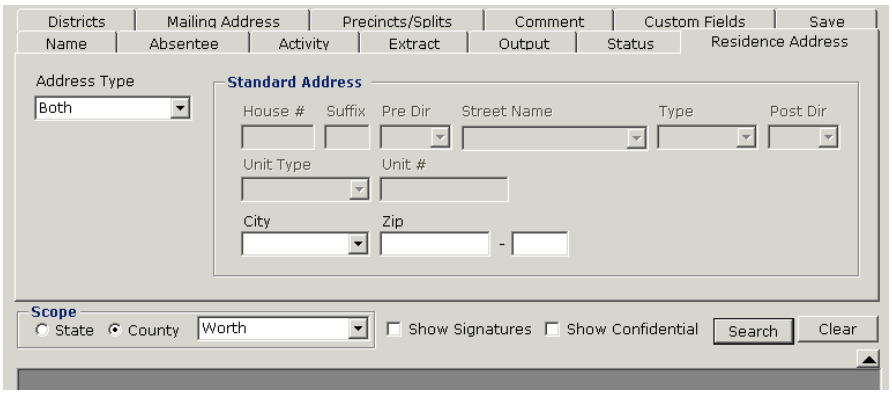


Figure 68. Residence (standard and non-standard), Mailing and Absentee Address Searches

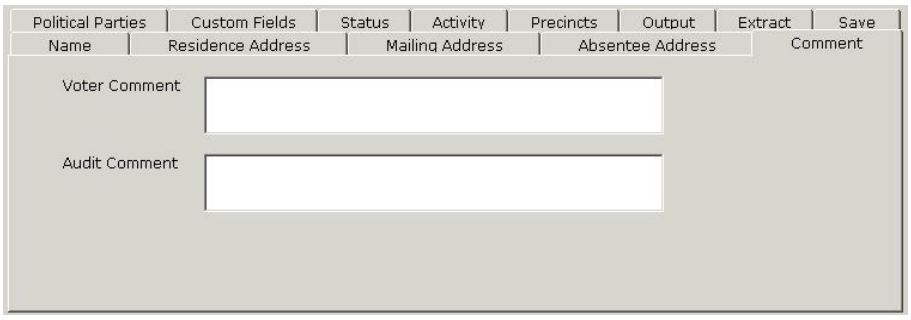


Figure 69. Comments Text Search

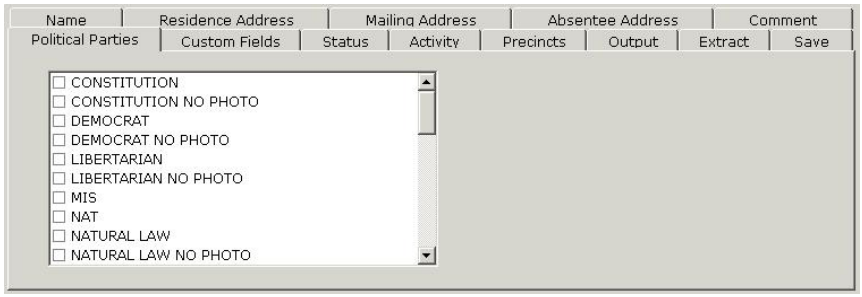


Figure 70. Political Parties Search

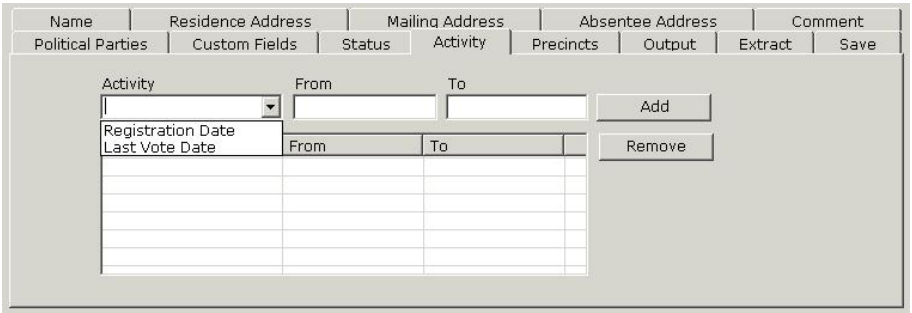


Figure 71. Any number of activities can be added to filter the search

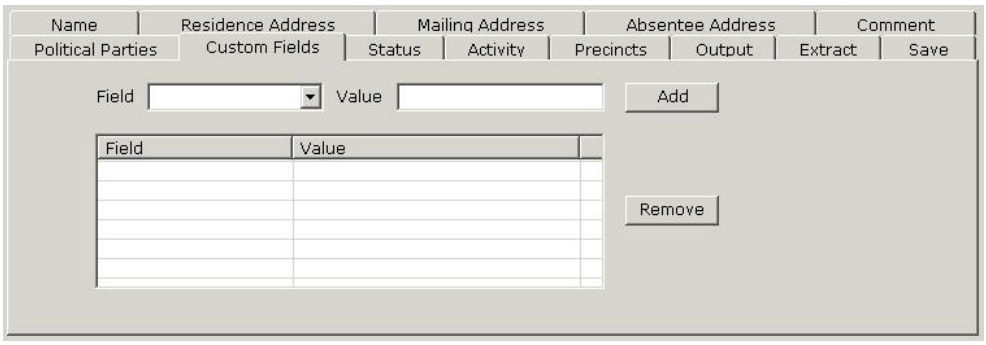


Figure 72. Custom Fields Search

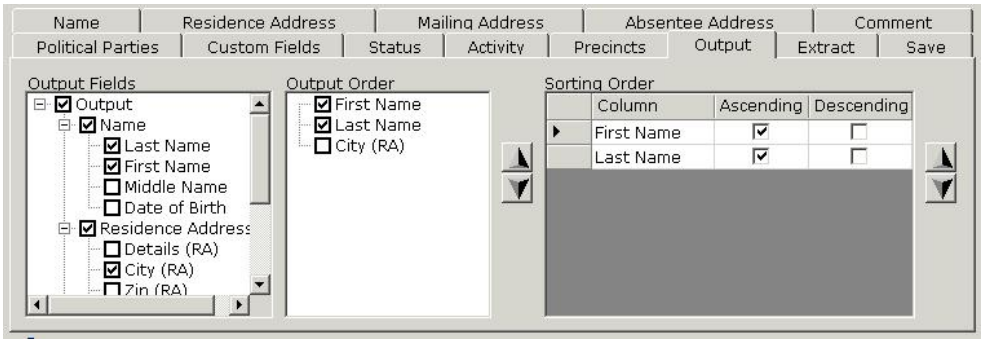


Figure 73. Ability to select output fields with order and sort

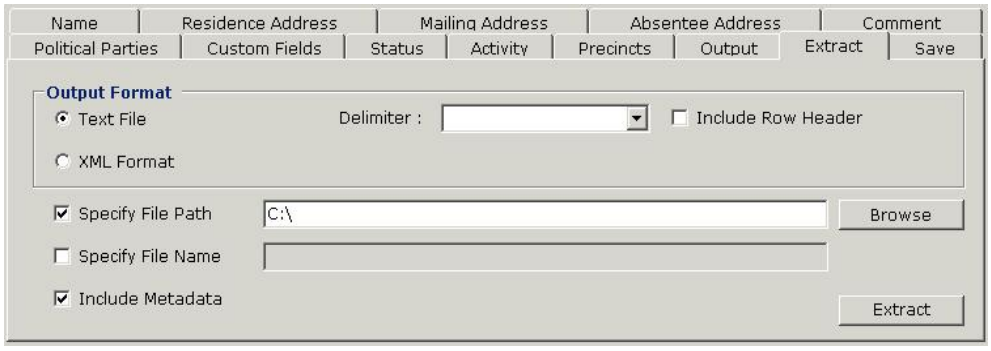


Figure 74. Ability to Export Query Results in Text and XML

The table below provides a list of the key standard reports of the system. New reports are being constantly added to the system. All reports will be customized to meet the needs of Wyoming, as identified during the JAD sessions.

Voter Registration Module
- Precinct Memorandum Card
- Notification Letter
- Voter Address Rules
- Various lists and statistical information

Batch Scanning
- Batch Header Sheet

Election Workers
- Payroll
- Labels
- Election Cost
- Worker List

Reports and Labels
- 15th of the Month
- Absentee Breakdown
- Duplicate Voters
- Absentee Flagged Voters Report
- Labels

Election Management
All reports are printed for the selected election and have no selection criteria unless specified.

- Daily Ballot Count
- Precinct/Party Ballot Count
- Replacement Ballot Report
- Undeliverable Ballot Report
- Ballot Format Results
- Ballot Format Abbreviated
- Ballot Format Key
- Ballot Format Precinct Key
- Ballot Format Counts
- Precincts in Ballot Format
- Ballot Format Contents
- Billing Worksheet
- Expense Apportionments
- Cost Worksheet
- Election Day Report
- Absentee Ballot Count
- Absentee Count by Ballot Type
- Absentee/Party Ballot Count
- Candidate Labels

Districts/ Precincts
- Code Areas and District Names
- Election Districts
- Levy Code Statistics
- Precinct Code Report
- Precinct/Party Voter Count
- Precinct, District, Code Area Report
- District Statistics
- Precinct Voter Counts
- District Voter Counts

Batch Printing
- Precinct Memo Cards
- Labels

Data Extraction
The Data Extraction module is capable of converting any query results into a text output file in various formats including XML.

Electus comes with a report and data extraction engine that allows for the generation, scheduling, and distribution of many canned and custom reports for each of the modules of the system.

8.2.13 System and User Documentation

Electus comes with thorough and complete documentation set for all the modules. The documentation is available in the form of online help to all users and is available in the form of training manuals. Our user documentation is developed from a user-centric perspective. It is easy to read and to use, providing users with all the information they need to get their work done—right at their fingertips. This is a sample of a help page in the Voter Registration Module.

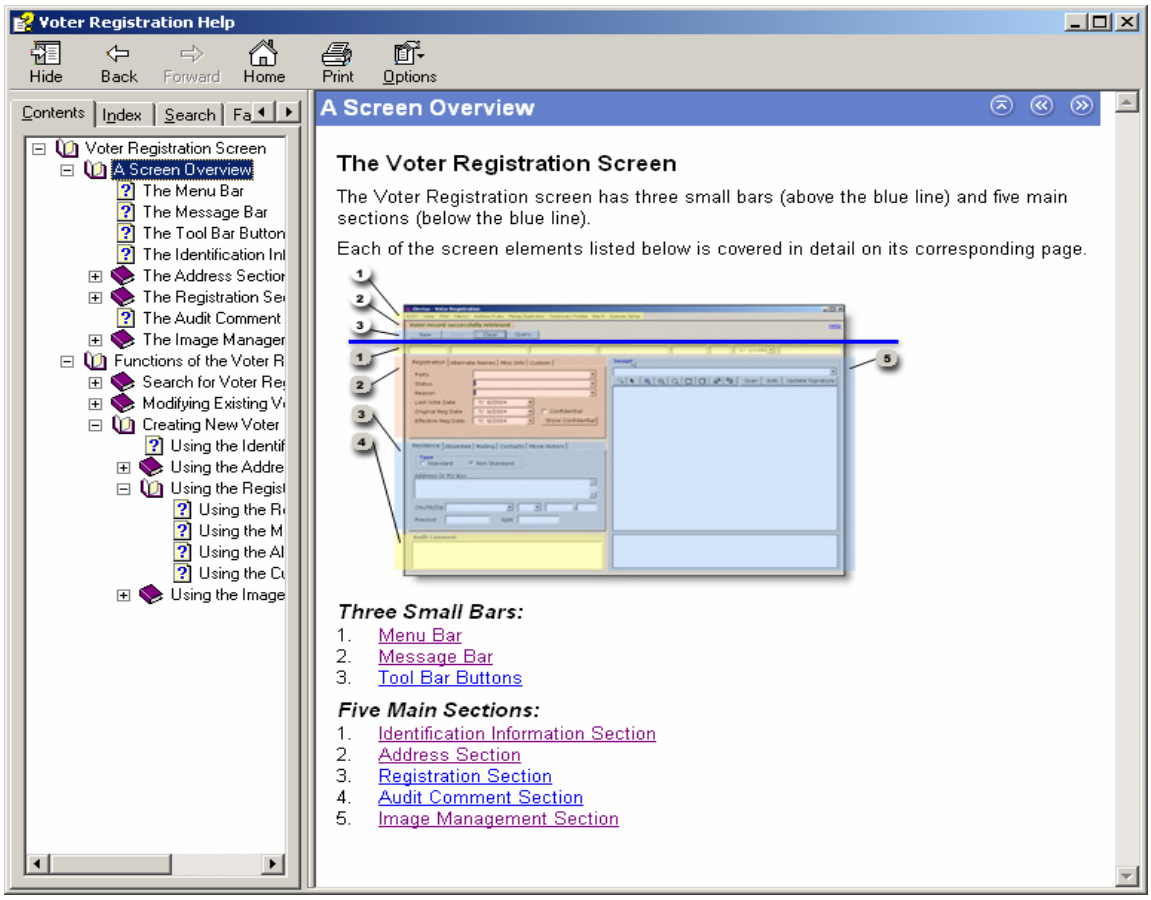


Figure 75. Sample Help Screen

The following documentation will be available in both electronic and print formats:

- User Guides
- Installation Guides
- Training Guides
- System Documentation
- System Administration Documentation

An important factor in knowledge transfer is the development of concise, user-friendly technical and user assistance documentation targeting specific needs to support the various phases of the system rollout. The system comes with an online help module that has the following features:

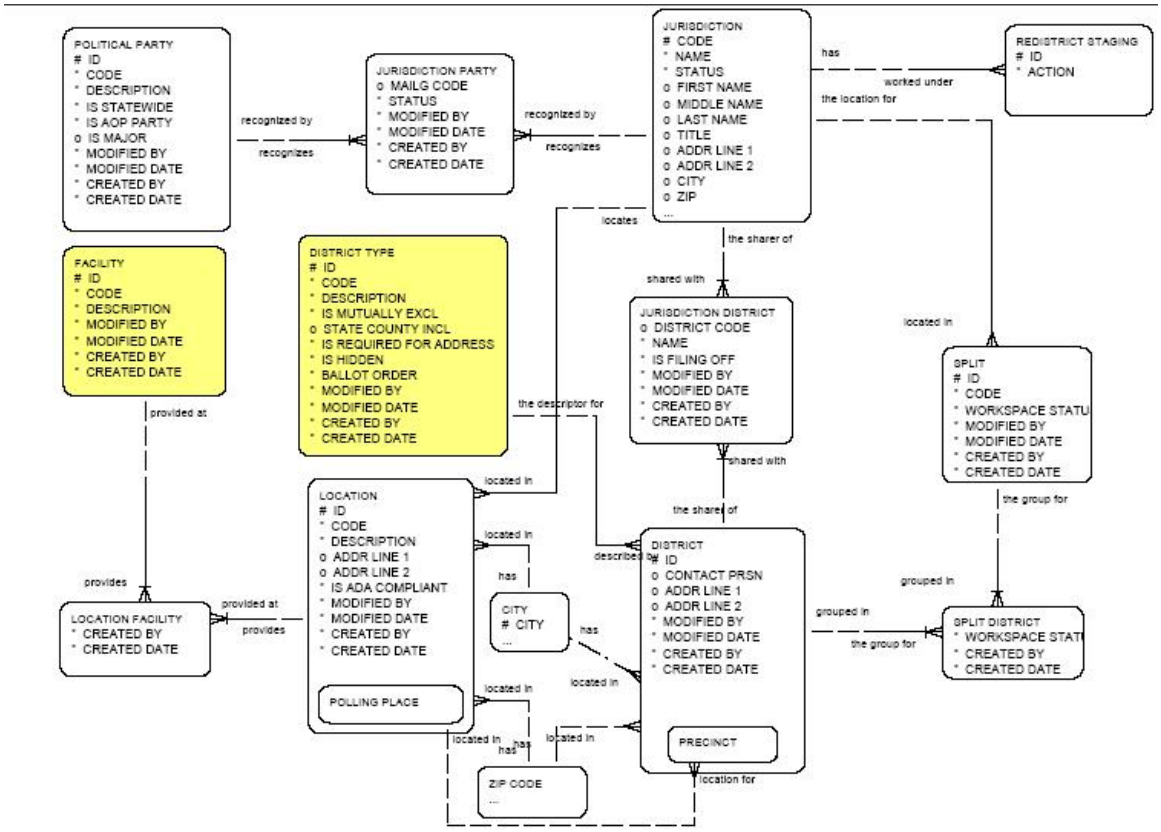
- Complete help system that covers all modules
- Based on the standard Windows help format
- Easily accessed (the help key - usually F1 function key) from any screen
- Standard help navigation interface that is familiar and user-friendly
- Searchable—entry of multiple keywords during help system development aids searching for online help
- Context-sensitive access to relevant screen help information

- Printer-friendly layout for output from online help with regular print command from the browser menu
- Easy to update for system upgrades—integrated to system upgrades when they are delivered

The availability of the help system online offers a great advantage when it comes to updates and system upgrades. When a module is upgraded, its own help module is also updated and uploaded to become available to all users immediately. In addition to the online help, Electus is built with meaningful messages and audio visual alerts that are displayed to the user at run-time when validations fail or action is needed from the users. These alerts help the users in completing the tasks successfully and in the right manner. In addition to user documentation, the system also comes with a complete set of technical documentation including:

Phase	Document
Analysis	Functional Requirement Specifications
	Individual JAD Records
Conceptual Design	Attributes Definitions & Dictionary
	Entity Definition and Relationship Diagrams
	Function Hierarchy Diagram
Application Design	Data Dictionary
	External Interfaces
	FRS Testing Tractability
	Product Environment
	Program Definition
	Requirements Traceability
	User Interface Specification
	DB Scripts – Tables, Indexes, Contraints, Sequences, SQL
Standards	Software Development Standards

The documentation also comes with a complete set of database schematic diagrams. These diagrams identify all of the lookup tables and other modules tables. The documentation includes a complete data model for the system, including detailed identification of all data elements, logical relationships, and a schematic diagram of the database tables and relationships. Following is an example database diagram:



DISTRICTS AND PRECINCTS

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Figure 76. Database Diagram – Districts and Precincts

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9. TRAINING

During the implementation of the system, training plays a critical role in the effective transfer of knowledge so that the county users can make the transition to the new system and processes. Saber has defined a program for the special training needs of the Wyoming counties. The implementation training program will be comprised of two parts:

- Zonal training for one week
- Onsite county implementation support and assistance for one week

This training bears a dual benefit; that on one hand the counties benefit from training with their colleagues from other counties, and on the other that they will have focused attention through hands-on training with the implementation staff in their own counties. Following this, if a need is identified for follow-on or additional training for any county or group of users during the implementation phase, Saber will be happy to look into those needs and organize additional sessions. Training will also be provided for the user groups for user acceptance testing and the counties for the Pilot.

9.1 Methodology

Our training methodology, which ensures user adoption of the WyoReg, starts with a five-step process to developing the training process:

1. Develop Training Outcomes
2. Design Curriculum
3. Develop Training Materials
4. Deliver Training/Train the Trainer
5. Evaluate Program

While we have already developed and tested a full set of training materials, these will be customized to the exact requirement for Wyoming needs. Saber will work with the state and counties to define the detailed expected outcomes from each functional area of training. Saber will then adjust the exiting training materials to meet the identified outcomes. After conducting each training session, the trainees will have the opportunity to give their feedback and comments in regards to the instructor and the efficiency of the class as a whole. Having conducted several successful enterprise wide training programs for hundreds of users, Saber has built the needed experience and best practices to ensuring a successful training engagement and has a positive approach to delivering the training:

- Saber will provide training sessions for the pilot counties early in the process to prepare for the pilot implementation.
- To be able to meet the project schedule and to maximize the efficiency of delivering the training, Saber recommends grouping the counties into zones and delivering the training at the zone level in order to maximize the success of the training.
- The primary training mode for end users will be hands-on classroom instruction. Other modes of training (e.g., one-on-one or on the job) will be utilized when and where they are determined to be the optimal training method.
- The infrastructure (classrooms and equipment) will be in place prior to the start of any training session.

- The schedule of the statewide training will be closely coordinated with the statewide rollout plan.
- To be able to continuously improve the quality of the training, Saber will conduct a training survey after each training session. The purpose of the survey is to evaluate the instructor and the training content and delivery method. Saber will use the feedback gained from these surveys to enhance future training sessions.
- Saber will train the users on a training database created on a test server. This will ensure that other databases (data migration validation, software testing, etc.) remain intact and will not be interrupted by the training sessions.
- Saber will provide adequate online help and training manuals for the number of students in each class. The training manuals will reflect the latest release of the system at all times.
- If the State and the counties desire, Saber welcomes the idea of videotaping selected training sessions and publishing the tapes to the various counties for future county internal training needs.
- Saber understands that ability to train others is an acquired skill. Performing a task well is not any indication of the ability to transfer these skills to others. Saber will dedicate highly skilled trainers to deliver the training. The trainers will have the required level of knowledge to be able to answer all questions about the functionality of the system.
- Saber also understands that trainees come to training from very different places. We have experience in dealing with people from a wide variety of experiences, from those with years of experience on sophisticated systems to those unfamiliar with using a mouse.
- Saber will survey the potential system users in order to determine their current level of computer usage skills. If the survey results produce a need for basic training, Saber will conduct such training. These training sessions will be focused on basic Windows training, as well basic Internet training.

9.2 Critical Success Factors

Addressing the following critical success factors will ensure that end users are provided with the critical training needed to perform the functions of the new system.

- A sufficient number of training facilities to accommodate the conduct of multiple training courses occurring simultaneously, given a maximum of approximately twenty users per training session.
- Training facilities that are physically adequate and easily and conveniently accessible to users in all counties.
- Classrooms that are well equipped. Since end user training will be "hands on," this means a workstation required for each user. Additionally, the instructor will need a workstation.
- Sufficient network connectivity/bandwidth for all classroom workstations.
- Sufficient instructor aids available within each classroom. These aids include an overhead projector, white board, flip charts, etc.
- Saber to purchase laptops at Wyoming's expense, as preauthorized by State. Saber will load software and configure the laptops and bring the laptops from training location to training location. The laptops are the property of the State and will be delivered to the State by Saber, following training.

9.3 Continuous Training

Saber understands that training is an ongoing process rather than a one-time function. Saber envisions a number of ways to accommodate the need for ongoing training:

- Implementing the train-the-trainer approach. This way the state and each county will have an onboard trainer to deliver the needed training for new staff on their own schedule.
- Videotaping selected training sessions and publishing the tapes to interested counties.
- Use prescheduled events like a county association conference to conduct refresher training session.
- Deliver short web-based training session using online tools like go-to-meeting or net meeting to accommodate urgent training needs.

9.4 Areas of Training

Training for the State will be available to the State at the State's discretion, which may be at any time, including time of transition from Saber hosting to other hosting. Saber recommends the following functional areas to be targeted for training. Future analysis of the requirements and user role identification may result in more functional areas for training. For each of the following areas, Saber will work with the State to identify the exact requirements for training in each area and identify the level of needed commercial pre-training for anticipated trainees in each area.

Functional Area	Training	Duration
Application Training (County Users)	Saber will provide application training during the pilot implementation and prior to the final rollout of the system. This training is designed for the State users who will be responsible for managing all the statewide features of the system. This training will also include training the users on the needed functions of the application relevant to the State, like setting up a statewide election. Saber envisions the production system rollout to take place on weekly basis for groups of counties. Saber will conduct the training in the regional locations for each implementation.	5 days
Architecture Training (State Technical Staff)	Saber will provide training for up to six State staff members regarding the operation, maintenance, remote management, and on-site support of the architecture, security, and data centers. Saber anticipates the audience of this training to have received previous formal training on the various specialized commercial system components, especially the security equipment.	2 days
Software Training (State Technical Staff)	Saber will provide training for up to six State staff members on the various system software components to support the infrastructure. Saber anticipates the audience of this training to have received previous formal training on the various specialized commercial software components (such as Visual Basic) used to support the system. This training provides students with the knowledge and skills necessary to maintain and manage the implemented software components of the system, including the object-oriented design of the system.	2 days

Functional Area	Training	Duration
Database Training (State DBAs)	Saber will conduct training for up to four State staff members regarding the basic support and maintenance of the database. Saber anticipates all trainees of this functional area to have received prior training in the administration of the Oracle database.	2 days
Maintenance, Support and Operations (State Support Staff)	Saber will provide training for up to four State staff members on the maintenance and support aspects of the application and the application development tools. The training will include the issues reporting techniques and tracking the stages of promoting modules from development to production.	2 days
Application Development Tools Training (State Developers)	The Electus application is developed using the following tools: • Visual Basic .NET (using Visual Studio 2003) • Image Basic Imaging tool • Vision Shape Imaging tool • Active Reports Saber anticipates all trainees of this functional area to have prior experience in VB.NET. Saber will provide training for up to six State staff on the implementation of the above tools in the Electus application.	2 days
Maintenance, Support and Operations (State Support Staff)	Saber will provide training for up to four State staff members on the maintenance and support aspects of the application and the application development tools. The training will include the issues reporting techniques and tracking the stages of promoting modules from development to production.	2 days

10. WARRANTY AND LONG TERM SUPPORT OPTIONS

Saber will provide the Platinum support program for the State of Wyoming in this implementation. The SLA for support under this program will include the following mandatory services:

1. Application Support including providing support:
    a. Changes in State or Federal law
    b. Changes to the application desired by users and approved by the Standards Committee either to existing modules or development of new modules based on new post-implementation change orders
    c. Bug fixes and other corrections to the application because it does not perform in accordance with the most up-to-date copy of the requirements document, including all change requests
2. End-User Help Desk and Support
3. Warranty through the course of implementation and till the end of 2007 even if the project is completed earlier.
4. Infrastructure and Security Monitoring

Saber will provide one year of support through the calendar year 2008, to ensure that we assist in the conduct of a successful presidential election in 2008. Following that, the state of Wyoming will have the option to extend the services if they choose to avail of the base option.

In addition to the mandatory support services, we have also provided options for Primary and Secondary Site Data Hosting services.

10.1 Application Support

Saber will support the Electus application throughout the support period. Our support plan envisions and implements several types of changes to the system, prioritized as follows (or differently as mandated by the State):

- Changes in the Application required because of changes in state and/or federal law. Saber guarantees that it will provide the required changes and updates to WyoReg prior to the deadline required by the state of federal law.
- Changes in WyoReg requested by state or county users. These changes will need to be approved by the State (we recommend using a Standards Committee to approve all such changes) before Saber will work on them. Every time a new change is added to the support queue we will work with the State to prioritize the list of changes (in case there is more than one change requested or pending) to ensure that the most critical changes are made first. Once a change request is submitted by the State to Saber, we will commit to a reasonable delivery date for that change; this date will be decided in conjunction with the State.
- Changes in the Electus application due to new features or enhancements made by Saber to the application. These upgrades will be offered to the State at least annually.
- Bugs (defects) in WyoReg will be worked on and corrected as soon as they are found and reported. Defects include all variances or issues with the application when compared to the most up-to-date Requirements document including all approved change orders.

Saber will provide two dedicated development resources adding up to 320 hours of development effort every month during Platinum Support. The Saber Account manager in support will work with the project steering committee to prioritize items in support to best utilize this bucket of hours. There will be quarterly application releases through the support year. All changes will be accompanied by corresponding changes in the documentation and online help so that revisions to the help system and documentation are always aligned with changes in the application. Users will have access to a toll-free number, an email address, and an online system (SPIRIT) to report and track all issues. Saber will respond to severe, high, medium, and low issues in the timeframes (appropriately, depending on whether it is a peak or non-peak election period).

10.2 Helpdesk

As part of system support, Saber will provide a live twenty hours/day dedicated HAVA help desk during peak election periods that is dedicated to and trained in the WyoReg application. Regular Help Desk hours will be 8-5, MT M-F. Extended election support can be requested by the SOS with a two-week notice to Saber. Basically, the 20-hour service is more like extended hours, 7 a.m. (maybe earlier) to 10 p.m. Typical peak periods would be 1) elections, 2) entry data times, 3) purge times. The key elements of helpdesk are:

- SPIRIT - Online Issue Tracking Tool
  - Instant Issue Logging and Ticket # on first call
  - County Ability to Track Issue Progress online
- Dedicated Program Toll Free Numbers and Email
- Dedicated Functionally Trained Helpdesk Staff
- Fully Manned Work Hours Support
- Extended Election Support
- Established SLA and Response Times

Helpdesk services are described in detail below.

Comprehensive support will be provided during normal work hours (Monday – Friday, 8 a.m. to 5 p.m. Mountain Time), once the counties go into Pilot and through production. Following the implementation of the first county, the complete helpdesk program as described below will be activated.

Peak Election Period (60 days prior to & 60 days after any election)	
Priority Level	**Response Time**
Severe/Urgent-Show Stopper	1 hour phone response
High	2 hour phone response
Medium	8 hour phone response
Low	48 hour phone response
Non-Peak Election Period	
Priority Level	**Response Time**
Severe/Urgent-Show Stopper	2 hour phone response
High	8 hour phone response
Medium	48 hour phone response
Low	3 day phone response

Note: Phone response will be supported by remote access or onsite visit to assess and fix the issues at the earliest possible time, depending on the priority and the urgency of the situation.

Service	Level
Application Availability	99.99%
Local Area Network Availability	100% (does not include county networks or MNT)
Data Base Availability	99.99%
Response Time	5ms for round trip transaction, measured from demark point of state network, to WyoReg and return to demark point.
Backup success	99.9% (assumes tape backups and successful completion of backups of all data sets on daily, weekly, and monthly schedule).
Backup completion	99.99% (backup window is not exceeded).
Backup validations	100% (validation that backups can be used to restore either individual data elements and or restore entire system. Tested quarterly)
Hardware availability	100% (assumed achievable due to clustering of all environments)
Application problems Priority 1 and 2	No more than three (3) "Severe" and five (5) "High" problems monthly after the go live pilots of operation. After the first three months no more than one (1) "Severe" and three (3) "High" problems monthly. The State and the vendor will mutually agree upon a reasonable number of priority level Medium and Low issues. However, Saber will ensure that all Urgent-Show Stopper (Severe) Issues will be promptly responded to and fixed as part of support.
Mean Time to Repair (MTTR - the amount of time between failure and repair to full functionality)	% Application Availability = (MTBF * 100) / (MTBF + MTTR) Mean Time Between Failures (MTBF) is the average time device functions before failing.

The summary description of the three tiers is:

Tier 1—Owns the Problem

- Enters issues into SPIRIT
- Escalates as appropriate to Tier 2
- Communicates with customer through to problem resolution
- Verifies issues are closed with customer

Tier 2—Communicates and Coordinates

- Prioritizes issues in SPIRIT
- Coordinates resolution with Tiers 1 and 3
- Escalates issues to Management or Executive Sponsor as appropriate
- Leads requirements gathering and provides estimates to Change Control Board
- Prioritizes ongoing development

Tier 3—Owns the Solution

- Enters progress data into SPIRIT
- Works on issues in priority order
- Communicates with Tier 2 through to problem resolution
- Marks issues as resolved in SPIRIT
- Performs ongoing development and technical troubleshooting

Every step of the way, the SPIRIT tracking item is updated with comments. At any time, end-users can call, email, or fax for up-to-the-minute status updates on issues opened with the help desk. End-users will know if an item has moved into development, is awaiting review, or has been resolved and is in internal testing. Saber recognizes the importance of communication in providing excellent customer service. The tool that Saber uses for tracking of helpdesk activities is Jira from Atlassian and we would recommend the same to the state. This online tool is easily accessible to the counties for tracking of trouble tickets too.

A graphic representation of Saber's helpdesk and support function is provided in the following diagram.

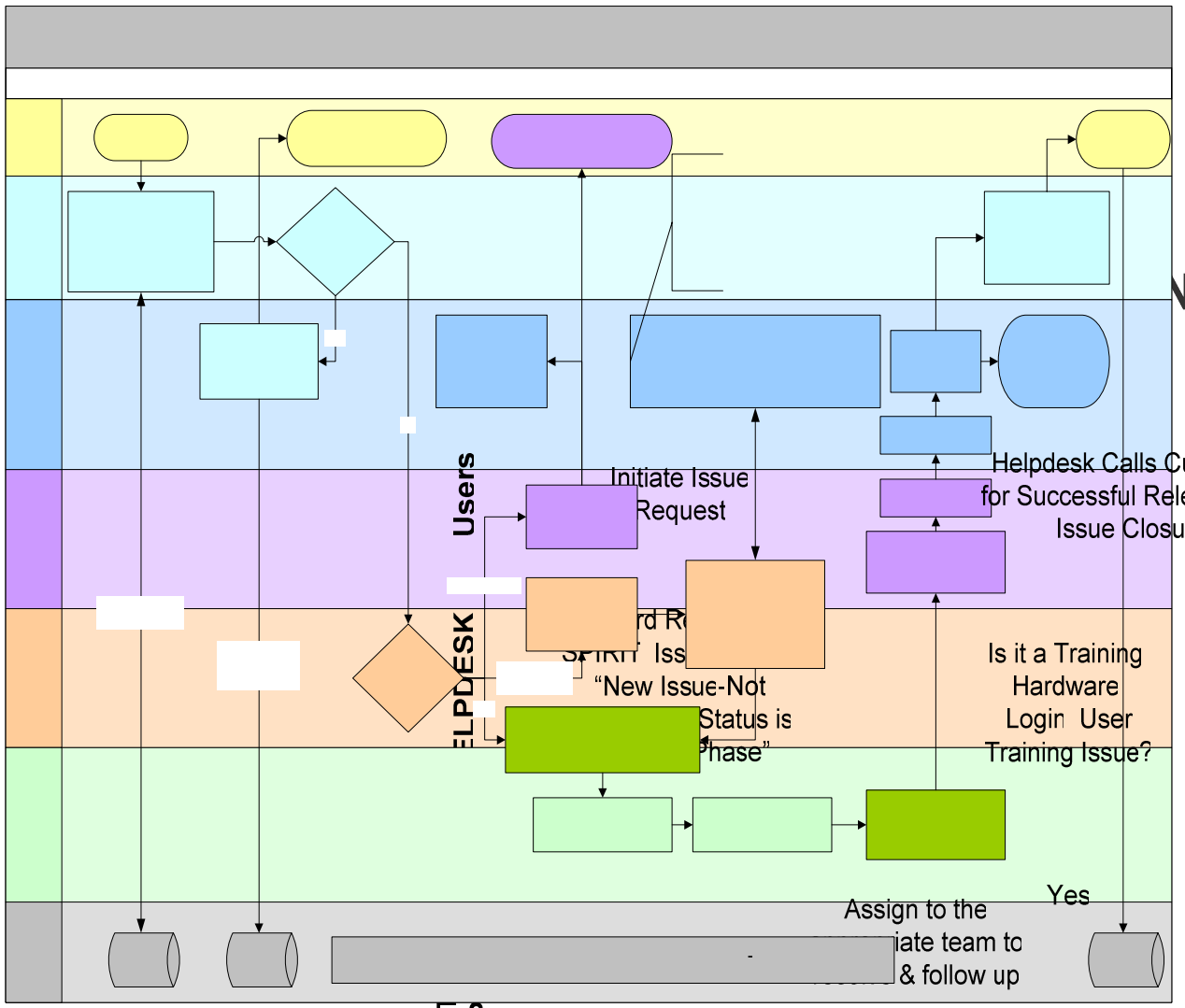

Figure 78: Effectus Support and Change Control

10.3 Infrastructure and Security Monitoring

Network Support includes the following:

- Full-time dedicated support technician, who will serve as the primary contact and system/backup administrator
- All support staff trained on the overall system configuration, critical services, network topology, and hardware
- Separate/private support queue for all service related to the WyoReg system
- Operating system patches, updates, security audits will be applied after successful install of the WyoReg system
- Specified software upgrades and testing
- Network troubleshooting and diagnostics
- Network monitoring/server monitoring: monitoring system includes web based stats, network mapping for easy viewing and diagnosis of network events
- Full reporting capability will be provided on the uptime of the servers, network interfaces, windows services
- Specified critical windows services will be monitored and automatically restarted by monitor servers
- Saber staff will be immediately notified by pager and email of any network and server events
- Web, SQL, Mail, etc. any TCP/IP service specified will be monitored, and have full reporting capabilities – this list to be determined by the Saber and system administrators
- Monthly reports on status and availability will be emailed, and printed for historical archiving

Monitoring

Saber will procure and install necessary equipment to monitor network connections 24x7x365 for reliability and performance.

- Monitoring system will be fault-tolerant to ensure continuity in performance
- Will check availability of individual network ports
- System will notify specified Saber personnel about connectivity and availability issues. Notification will be multi-tiered by e-mail, text messaging, and other means

11. PRICING

Based on the needs of this project and the aggressive schedule for implementation, Saber is providing a pricing proposal that is made up of both mandatory and optional elements. The mandatory elements of the proposal are:

1. Requirements Gathering and Analysis, Application Customization to Wyoming laws and business processes, Data Conversion, User Training and complete implementation of the unified Statewide Voter Registration and Election Management System (WyoReg).
2. One year of support starting January 1, 2008 to December 31, 2008 to ensure the successful conduct of the 2008 Presidential Election that includes:
    a. Application Support
    b. End-user Helpdesk
    c. Infrastructure and Security Monitoring.

The features provided are:

1. Data Hosting Services for the primary and secondary sites
2. Saber Procurement of Hardware and Software

We have also provided multiple options for the number of years of support services as well as for the optional services. Saber will be happy to discuss and explore these options further to arrive at the best strategy and approach that will meet the needs of the State of Wyoming.

The solution cost details are provided on the following pages.

Project Labor Cost Table	
Description	**Total Cost**
Customization	
Baseline Electus source code on CD (Electus Software License); Fully paid up, worldwide, royalty free source code ownership (no marketing rights) transferred to Wyoming	$ 750,000.00
Requirements Gathering, JAD's, Analysis	
Interface JAD Sessions, Analysis	$ 40,000.00
Application JAD Sessions, Analysis	$ 60,000.00
Reports JAD Sessions, Analysis	$ 40,000.00
Software Design Changes	$ 75,000.00
Software cutomization Prototype 1; Customized Source Code installed and delivered on CD	$ 165,000.00
Software cutomization Prototype 2; Customized Source Code installed and delivered on CD	$ 165,000.00
UAT Ready Software	$ 125,000.00
Software Ready for the Pilot (Software ready for 9 pilot counties)	$ 125,000.00
Software customization based on feedback from Pilot Counties (Software ready for final implementation); Customized Source Code installed and delivered on CD	$ 140,000.00
Software Customization based on feedback from November 2008 Election Cycle; Customized Source Code installed and delivered on CD	Included
Software Development of Interfaces with Partner Agencies	$ 120,000.00
Customization Total	$ 1,805,000.00
Conversion	
Master Data Reference	$ 40,000.00
Detailed Data Mapping & Translation Document for each county	$ 85,000.00
Pilot Counties (6) Delivery of Error, Reconciliation and Control Reports	$ 30,000.00
Group 1 - Delivery of Error, Reconciliation and Control Reports	$ 20,000.00
Group 2 - Delivery of Error, Reconciliation and Control Reports	$ 20,000.00
Group 3 - Delivery of Error, Reconciliation and Control Reports	$ 20,000.00
Group 4 - Delivery of Error, Reconciliation and Control Reports	$ 20,000.00
Data Clean-Up Pilot Counties	$ 15,000.00
Data Clean-Up Remaining Counties	$ 35,000.00
Pilot Counties Data Migration and Verification	$ 55,000.00
Wave 1 Data Migration and Verification	$ 55,000.00
Wave 2 Data Migration and Verification	$ 55,000.00
Wave 3 Data Migration and Verification	$ 55,000.00
Wave 4 Data Migration and Verification	$ 55,000.00
Conversion Total	$ 560,000.00
Training	
UAT Application Training	$ 40,000.00
Application Training for Pilot Counties	$ 60,000.00
Wave 1 - Training	$ 80,000.00
Wave 2 - Training	$ 80,000.00
Wave 3 - Training	$ 80,000.00
Wave 4 - Training	$ 80,000.00
Architecture Training	$ 12,000.00
Software Training	$ 12,000.00
Database Training	$ 12,000.00
Application Development Tools Training	$ 12,000.00
Maintenance, Support and Operations	$ 12,000.00
Training Total	$ 480,000.00

*** SOS to provide or pay for training facilities and training facility hardware and equipment**

Testing	
Development of Application Test Scripts for Pilot Counties	$ 60,000.00
Development of Application Test Scripts for Final Implementation (after feedback from Pilots)	$ 30,000.00
Detailed Security, Performance, System, and Load Test Plan	$ 45,000.00
User Acceptance Testing	$ 125,000.00
Security Testing	$ 75,000.00
System Testing	$ 75,000.00
Load Testing	$ 75,000.00
Testing Total	$ 485,000.00
Implementation / Installation / Configuration	
Procure and Install Development, Test, Training Environments (preferred site for this will be Saber's Salem development center rather than SOS; no additional cost to SOS for Saber hosting these	$ 90,000.00
Implementation of Interfaces to Partner Agencies per Interface Plan	$ 60,000.00
Procure and Install Servers, Networking Equipment, and Software for Primary Hosting site	$ 120,000.00
Procure and Install Servers, Networking Equipment, and Software for Secondary Site	$ 120,000.00
Implementation / Installation / Configuration Total	$ 390,000.00
Project Management (others)	
Project & Executive Management Oversight and Project Status Reporting	$ 325,000.00
Initial Project Plan	$ 60,000.00

Detailed Functional Requirements Specification and Gap Analysis Document after JAD Sessions	$	70,000.00
Detailed Interface Requirements to Partner Agencies (Dept. of Public Health, DPA, DOC)	$	45,000.00
Customized User Documentation (Ready for Pilot Counties)	$	90,000.00
Customized User Documentation (After feedback from pilot counties; Ready for Production)	$	35,000.00
Customized System Technical Documentation	$	60,000.00
Customized Training Materials (Ready for Pilot Counties)	$	45,000.00
Customized Training Materials (After feedback from pilot counties; Ready for Production)	$	35,000.00
Project Finalization Report		
Other Total	$	765,000.00
TOTAL PROJECT LABOR	$	4,485,000.00
OPTIONAL SERVICE: Installation and implementation of county hardware (we are not sure if this equipment is already installed in counties)	$	140,000.00

Operations Platinum Support Labor Cost Table

Description		Total Cost
Help Desk		
Help Desk (Annual Fee). Payment for Help Desk begins on Jan 1, 2008 (or earlier or later depending on the date on which the final county is moved into production. While help desk services will be offered as early as when the pilot counties move into implemenation those fees are covered Project Labor Costs).	$	128,000.00
Help Desk Total	$	128,000.00
Operational Support		
Operational Support (Annual Fee). Payment for Operational Support begins on Jan 1, 2008 (or earlier or later depending on the date on which the final county is moved into production. While operational support will be offered as early as the primary and disaster recovery datacenters are set up, those fees are already included in project labor costs).	$	217,000.00
Operational Support Total	$	217,000.00
Application Support		
Support for WYOREG (Annual Fee). Payment for Application Support begins on Jan 1, 2008 (or earlier or later depending on the date on which the final county is moved into production). Application support includes changes that may be required to the application for the following reasons:	$	380,000.00
a. Changes in the Application required because of changes in State and/or Federal law. Saber guarantees that it will provide the required changes and updates to the Application prior to the deadline required by the State of Federal law.		
b. Changes in the Application requested by Wyoming State or County users. These changes will need to be approved by the SOS (we recommend using the Standards Committee to approve all such changes) before Saber will work on them. Every time a new change is added to the support queue we will work with the SOS to prioritize the list of changes to ensure that the most critical changes are made first. Once a change request is submitted by the SOS to Saber we will commit to a reasonable delivery date for that change; this date will be decided in conjunction with the SOS.		
c. Changes in the Electus™ application due to new features or enhancements made by Saber to the application. These upgrades will be offered to the State at least annually.		
d. Bugs (defects) in the Application will be worked on and corrected as soon as they are found and reported.		
Other Total	$	380,000.00
TOTAL ANNUAL OPERATIONAL LABOR	$	725,000.00
****Annual Support costs will increase by 4% annually**		
Application Administration Support		
Optional Service: Onsite Application Adminsitration Support (Annual Dee) Starts Jan 1, 2008. To be conducted on site at the State and County Level to be undertaken at the WY SOS office by Saber Staff. Also includes onsite project management of Saber's Support Phase	$	197,000.00
Support for all operations from Nov 16,2007 - Dec 31, 2007 includes Helpdesk, Application and Operations Support	Included	
Optional Service: Help Desk for issues related to county hardware including desktop, scanner, label printer, printer, barcode reader, etc. including managing third party hardware and software vendor relationships and overseeing product returns and replacements	$	100,000.00

Hourly Rate Table*

Position Description	Rate / Hour
Consultant	$125/hour
Senior Consultant	$140/hour
Manager	$160/hour
Director	$175/hour
Vice President	$200/hour
Technical Writer	$75/hour
Trainer	$100/hour

Hardware Cost Table		MAA			PBA		
Description	Make & Model	# of Units	Cost / Unit	Total Cost	# of Units	Total Cost	MAA Annual Maintenance
Servers							
Oracle 10g Database Servers	HP Proliant DL385 Dual Xore Opteron Solution w/ 1 x Dual Core CPUs, 12GB RAM, 6 x 146 GB HDs, DVD ROM, Floppy Drive	4	$15,292.00	$ 61,168.00	4	$61,168.00	
Oracle 10g Dataguard Server	HP Proliant DL385 Dual Xore Opteron Solution w/ 1 x Dual Core CPUs, 8GB RAM, 6 x 146 GB HDs, DVD ROM, Floppy Drive	1	$14,292	$ 14,292.00	1	$14,292.00	
Citrix Web Servers	HP Proliant DL360 G5 Solution w/ Dual CPUs, 4GB RAM, 2x 36GB HDs, DVD ROM	4	$4,500	$ 18,000.00	4	$18,000.00	
Citrix Secure Ticketing Authority Servers	HP Proliant DL360 G5 Solution w/ Dual CPUs, 4GB RAM, 2x 36GB HDs, DVD ROM	4	$4,500	$ 18,000.00	4	$18,000.00	
Citrix Presenstation Servers	HP Proliant DL360 G5 Solution w/ Dual CPUs, 4GB RAM, 2x 72GB HDs, DVD ROM	4	$5,100	$ 20,400.00	7	$35,700.00	
Citrix Access Gateway	Citrix HV 2000 1U	4	$ 2,200.00	$ 8,800.00	3	$6,600.00	$2,000.00
Management Servers	HP Proliant DL385 Dual Core Opteron with 1x dual core CPU, 4GB RAM, 6 x 146 GB HDs, DVD ROM, Floppy Drive	3	$8,300	$ 24,900.00	3	$24,900.00	
Windows authentication and DNS servers	HP Proliant DL385 Dual Core Opteron with 1x dual core, 4GB RAM, 4 x 146 GB HDs, DVD ROM	4	$7,400	$ 29,600.00	3	$22,200.00	
Networking & Security Devices							
Firewall & IPSEC VPN	NetScreen Firewall – 204	2	$5,000	$ 10,000.00	2	$10,000.00	$1,643.00
Advanced Intrusion Prevention System	TopLayer IPS 5500 -100	2	$24,400	$ 48,800.00	2	$48,800.00	$7,200.00
Intrusion Prevention Appliance	IPS GX 4002-C (Including Server Sensors for both the sites)	2	$12,000	$ 24,000.00	2	$24,000.00	$4,500.00
Routing and packet filtering (48 ports) - Backbone for trusteed network	Cisco Router 3560	4	$6,500	$ 26,000.00	4	$26,000.00	$3,500.00
Switch & VLAN Configuration - Backbone for DMZ network (20 Ports)	Cisco Switches 2960	2	$ 3,300.00	$ 6,600.00	2	$6,600.00	$1,100.00
Switch & VLAN Configuration - Backbone for DMZ network (44 ports)	Cisco Switches 2960	4	$ 5,200.00	$ 20,800.00	4	$20,800.00	$3,000.00
F5 Global Load Balancer	F5 GLOBAL TRAFFIC MANAGER	2	$17,000	$ 34,000.00	2	$34,000.00	$5,600.00
F5 Local Load Balancer	F5 LOCAL TRAFFIC MANAGER	2	$26,500	$ 53,000.00	2	$53,000.00	$9,000.00
Network configuration Management, 25 Lic BUN	Tripwire Software	1	$11,000	$ 11,000.00	1	$11,000.00	$2,800.00
Racks & Accessories							
KVM console for Networking devices	Cyclades AlterPath ACS32 SDC 32 RS232 RJ45 Ports Single Power Supply AC	2	$2,900	$ 5,800.00	2	$5,800.00	$300.00
Tape Backup Unit	HP Tape Library Solution	2	$30,000	$ 60,000.00	2	$60,000.00	
Storage Area Network	HP MSA 1000	2	$30,000	$ 60,000.00	2	$60,000.00	
RAC Interconnect	HP Switch for RAC Interconnect	2	$3,000	$ 6,000.00	2	$6,000.00	
Physical Rack	HP 42 U Rack, Side pannels, Rackmount, Monitor and keyboard	4	$7,900	$ 31,600.00	4	$31,600.00	
Training Laptops		20	$1,000	$ 20,000.00			
Power units for racks	PDU 24A MPDU HIGH VOLTAGE OUT: 32X C13 IN: L6-30P	10	300.00	$ 3,000.00	10	$3,000.00	
				TOTAL HARDWARE	**$ 615,760.00**	**$601,460.00**	**$40,643.00**

Notes & Assumptions

*** Please note that all network and security equipment has been priced with 1 year of next day onsite support**
*** Hardware includes all hardware needed to operate 2 datacenters**
*** All equipment proposed is for production sites; primary and disaster recovery. Development, testing, and training environemnts are also listed belov**
*** Training laptops are the property of the state and will be returned to the SOS after the training is complete**

Software Cost Table		MAA			PBA		
Description	Make	# of Units	Cost / Unit	Total Cost	# of Units	Total Cost	MAA Annual Maintenance
Citrix Presentation Services							
Terminal Services	Microsoft 2003	200	$ 82.00	$ 16,400.00	200	$16,400.00	
Presentation Server	Citrix Enterprose Server 4.0	200	$ 250.00	$ 50,000.00	200	$50,000.00	
Access Gateway	Citrix Standard	200	$ 90.00	$ 18,000.00	200	$18,000.00	$20,000.00
Database Server	Oracle 10G	5	$ 24,400.00	$ 122,000.00	7	$170,800.00	$28,600.00

Clustering Software	Oracle RAC 10G	4	$ 12,500.00	$ 50,000.00	6	$75,000.00	$11,440.00
Operating Systems for database servers	RedHat Enterprise Linux Server	5	$ 2,500.00	$ 12,500.00	5	$12,500.00	$3,500.00
Operating Systems for one Management Server	RedHat Enterprise Linux Server	1	$2,500	$ 2,500.00	1	$2,500.00	
Operating Systems for other servers	Microsoft Windows Server 2003	18	$ 761.20	$ 13,701.60	20	$15,224.00	
Antivirus for Servers	McAfee 8i	18	$ 50.00	$ 900.00	20	$1,000.00	$500.00
Imaging Support for .NET	Hummingbird - ImageBasic	40	$ 330.00	$ 13,200.00	40	$13,200.00	
HP Server Management	HP ILO (Integrated Lights Out)	24	$ 240.00	$ 5,760.00	26	$6,240.00	
SLA Management	Indicative SLM	150	$ 81.40	$ 12,210.00	125	$10,175.00	$7,000.00
Security Monitoring Database	Microsoft SQL Server	1	$ 1,699.50	$ 1,699.50	1	$1,699.50	
SSL	Verisign	4	$ 1,500.00	$ 6,000.00	3	$4,500.00	$6,000.00
Server Backups	HP Data Protector	2	$ 30,000.00	$ 60,000.00	2	$60,000.00	$5,000.00
Proventia Server	Linux	6	$ 750.00	$ 4,500.00	7	$5,250.00	$1,050.00
Proventia Server	Windows 2003	18	$ 1,150.00	$ 20,700.00	20	$23,000.00	$5,000.00
			TOTAL SOFTWARE	**$ 410,071.10**		**$485,488.50**	**$88,090.00**
				$ 1,025,831.10		**$ 1,086,948.50**	**$ 128,733.00**

Notes & Assumptions

*** Oracle licensing is estimated at 50% discounted rate due to the smaller size of the application. Saber is trying for better discounts which when available will be passed through to the Wyoming SO**

*** Imaging software proposed is for an average of 2 desktops/county; if additional desktops need scanning support this number will increase**

Development Environment							
Oracle 10g Database Servers	HP Proliant DL385 Dual Xore Opteron Solution w/ 1 x Dual Core CPUs, 12GB RAM, 6 x 146 GB HDs, DVD ROM, Floppy Drive	1	$15,292.00	$ 15,292.00	1	$15,292.00	
Citrix Web Servers	HP Proliant DL360 G5 Solution w/ Dual CPUs, 4GB RAM, 2x 36GB HDs, DVD ROM	1	$4,500	$ 4,500.00	1	$4,500.00	
Citrix Presenstation Servers	HP Proliant DL360 G5 Solution w/ Dual CPUs, 4GB RAM, 2x 72GB HDs, DVD ROM	1	$5,100	$ 5,100.00	1	$5,100.00	
Software							
Terminal Services	Microsoft 2003	25	$ 82.00	$ 2,050.00	25	$2,050.00	
Presentation Server	Citrix Enterprose Server 4.0	25	$ 250.00	$ 6,250.00	25	$6,250.00	$1,250.00
Database Server	Oracle 10G	1	$ 24,400.00	$ 24,400.00	1	$24,400.00	$5,720.00
Operating Systems for database servers	RedHat Enterprise Linux Server	1	$ 2,500.00	$ 2,500.00	1	$2,500.00	$700.00
Operating Systems for other servers	Microsoft Windows Server 2003	2	$ 761.20	$ 1,522.40	1	$761.20	
Antivirus for Servers	McAfee 8i	2	$ 50.00	$ 100.00	1	$50.00	$50.00
SSL	Verisign	1	$ 1,500.00	$ 1,500.00	2	$3,000.00	$1,500.00
				$ 63,214.40		**$63,903.20**	**$9,220.00**

Notes & Assumptions

*** WY SOS will own the environement, but the development environment will be established in Salem. After initial procurement, the environment will be shipped to Salem and will be there for the duration of the development phase of the project**

Test Environment							
Oracle 10g Database Servers	HP Proliant DL385 Dual Xore Opteron Solution w/ 1 x Dual Core CPUs, 12GB RAM, 6 x 146 GB HDs, DVD ROM, Floppy Drive	1	$15,292.00	$ 15,292.00	1	$15,292.00	
Citrix Web Servers	HP Proliant DL360 G5 Solution w/ Dual CPUs, 4GB RAM, 2x 36GB HDs, DVD ROM	1	$4,500	$ 4,500.00	1	$4,500.00	
Citrix Presenstation Servers	HP Proliant DL360 G5 Solution w/ Dual CPUs, 4GB RAM, 2x 72GB HDs, DVD ROM	1	$5,100	$ 5,100.00	1	$5,100.00	
Software							
Terminal Services	Microsoft 2003	25	$ 82.00	$ 2,050.00	25	$2,050.00	
Presentation Server	Citrix Enterprose Server 4.0	25	$ 250.00	$ 6,250.00	25	$6,250.00	
Database Server	Oracle 10G	1	$ 24,400.00	$ 24,400.00	1	$24,400.00	$5,720.00
Operating Systems for database servers	RedHat Enterprise Linux Server	1	$ 2,500.00	$ 2,500.00	1	$2,500.00	$700.00
Operating Systems for other servers	Microsoft Windows Server 2003	1	$ 761.20	$ 761.20	1	$761.20	
Antivirus for Servers	McAfee 8i	1	$ 50.00	$ 50.00	1	$50.00	$50.00
SSL	Verisign	2	$ 1,500.00	$ 3,000.00	2	$3,000.00	$3,000.00
				$ 63,903.20		**$63,903.20**	**$9,470.00**

*** To maximize productivity, Electus requires the following county hardware that is not being proposed (per RFP). It is our expectation that SOS has procured and will provide suitable hardware as follows: Desktop PC, printer, scanner, label printer, barcode reader, scanner (scanner size depends on size of county). Saber recommends the following hardware for each user"**

Minimum Recommended Workstation Configuration

CATEGORY	PROPOSED SPECIFICATION
Processor:	Intel Pentium 1.5GHz or comparable
Cache:	256K
Memory:	256MB
Base Hard Drive:	20GB
Monitor or Flat Panel Display:	Any monitor capable of 1024x768 resolution. 17" is recommended.
Operating System:	Microsoft Windows 2000 or higher (XP, XP Pro)
Browser:	IE 5.5 or higher, OR, Netscape6 or higher
Other Software:	AntiVirus, ImageBasic Imaging License (for scanner connected workstations), Microsoft Windows Terminal Services
Ports:	At least 1 free USB port if this workstation is going to perform barcode scanning.

Printer	Xerox 4500 Phase II or equivalent
Label Printer	Dymo LabelWriter 330 or equivalent
Barcode Reader	WorthData Z110 or equivalent
Scanner	Canon DR3080 - CII (For larger counties we recommend bigger scanners)

Primary Hosting	Installation and Setup Costs	Services Monthly Costs	Monthly Reocurring Costs (MRC)	Annual Services Costs
	Qty/Unit	Unit Cost	Monthly Cost	Annual Costs
Data Center Hosting/Co-Location Space				
Physical Space at Hosting Location	1.0	$ 750.00	$ 750.00	$ 9,000.00
Sub-Total			$ 750.00	$ 9,000.00
Hardware/Software Provisioning				
Management fee for managing all servers	1.0	$ 2,400.00	$ 2,400.00	$ 28,800.00
Sub-Total			$ 2,400.00	$ 28,800.00
Cabinets / Racks				
No recurring costs. Base costs for procurement, installation, and setup already included on product page		$ -	$ -	$ -
Sub-Total			$ -	$ -
Cable Management				
No recurring costs. Base costs for procurement, installation, and setup already included on product page		$ -	$ -	$ -
Sub-Total			$ -	$ -
Telecommunication Services				
12 Mbps (burstable to DS3) connection to State Network	1.0	$ 5,890.00	$ 5,890.00	$ 70,680.00
Sub-Total			$ 5,890.00	$ 70,680.00
Equipment - Routing and Switching				
Management fee for managing all network and security equipment	1.0	$ 2,400.00	$ 2,400.00	$ 28,800.00
Sub-Total			$ 2,400.00	$ 28,800.00
Power / Energy Costs				
Power / Energy Costs including access to onsite generators	1.0	$ 720.00	$ 720.00	$ 8,640.00
Sub-Total			$ 720.00	$ 8,640.00
Security, Fire and Environment Monitoring				
Security, Fire and Environment Monitoring	1.0	$ 600.00	$ 600.00	$ 7,200.00
Sub-Total			$ 600.00	$ 7,200.00
Recovery Services				
Backup & Recovery Services including testing all backups according to backup plan	1.0	$ 1,800.00	$ 1,800.00	$ 21,600.00
Sub-Total			$ 1,800.00	$ 21,600.00
Other Managed Hosting Services				
24x7 Security Monitoring of all network devices & entire system	1.0	$ 2,800.00	$ 2,800.00	$ 33,600.00
Sub-Total			$ 2,800.00	$ 33,600.00
GRAND TOTAL			$ 17,360.00	$ 208,320.00

*

* Payment for hosting services begins as soon as the individual service is provided to SOS

** Payment for line items 31 and 34 above will begin as soon as the production data centers are up in running. It is planned that the data centers will be ready by 08/01/2007

Disaster Recovery Hosting	Installation and Setup Costs	Services Monthly Costs	Monthly Reocurring Costs (MRC)	Annual Services Costs
	Qty/Unit	Unit Cost	Monthly Cost	Annual Costs
Data Center Hosting/Co-Location Space				
Physical Space at Dublin Hosting Location	1.0	$ 750.00	$ 750.00	$ 9,000.00
Sub-Total			$ 750.00	$ 9,000.00
Hardware/Software Provisioning				
Management fee for managing all servers	1.0	$ 2,400.00	$ 2,400.00	$ 28,800.00
Sub-Total			$ 2,400.00	$ 28,800.00
Cabinets / Racks				
No recurring costs. Base costs for procurement, installation, and setup already included on product page		$ -	$ -	$ -
Sub-Total			$ -	$ -
Cable Management				
No recurring costs. Base costs for procurement, installation, and setup already included on product page		$ -	$ -	$ -
Sub-Total			$ -	$ -
Telecommunication Services				
12 Mbps (burstable to DS3) connection to State Network	1.0	$ 5,890.00	$ 5,890.00	$ 70,680.00
Sub-Total			$ 5,890.00	$ 70,680.00
Equipment - Routing and Switching				
Management fee for managing all network and security equipment	1.0	$ 2,400.00	$ 2,400.00	$ 28,800.00
Sub-Total			$ 2,400.00	$ 28,800.00
Power / Energy Costs				
Power / Energy Costs including access to onsite generators	1.0	$ 720.00	$ 720.00	$ 8,640.00
Sub-Total			$ 720.00	$ 8,640.00
Security, Fire and Environment Monitoring				
Security, Fire and Environment Monitoring	1.0	$ 600.00	$ 600.00	$ 7,200.00
Sub-Total			$ 600.00	$ 7,200.00
Recovery Services				
Backup & Recovery Services including testing all backups according to backup plan	1.0	$ 1,800.00	$ 1,800.00	$ 21,600.00
Sub-Total			$ 1,800.00	$ 21,600.00
Other Managed Hosting Services				
24x7 Security Monitoring of all network devices & entire system	1.0	$ 2,800.00	$ 2,800.00	$ 33,600.00
Sub-Total			$ 2,800.00	$ 33,600.00
GRAND TOTAL			$ 17,360.00	$ 208,320.00

*

* Payment for hosting services begins as soon as the individual service is provided to SOS

** Payment for line items 31 and 34 above will begin as soon as the production data centers are up in running. It is planned that the data centers will be ready by 08/01/2007

Total Cost Table				
Item	Original Cost	Annual Support Cost	Annual Maintenance	
LABOR COSTING - Till Dec 31, 2007 - ONE TIME COST				
One Time Implemenation Services and Labor Cost	$ 4,485,000.00			
SERVICES TOTAL	$ 4,485,000.00			
ANNUAL OPERATIONS COSTING - 1ST YEAR STARTS JAN 1, 2008 - DEC 31, 2008				
Platinum Support	$ 725,000.00	$ 725,000.00		
Onsite Application Adminstration Support				Per discussions on 2/28 Services not needed
Support for Nov 16-Dec 31, 2007	Included	$ -		
Primary Hosting	$ 208,320.00	$ 208,320.00		
DR Hosting	$ 208,320.00	$ 208,320.00		
SUPPORTSERVICES TOTAL	$ 1,141,640.00	$ 1,141,640.00		
OPTIONAL HARDWARE AND SOFTWARE COSTING - ONE TIME COST				
Hardware & Networking Cost Total	$ 615,760.00		$40,643.00	
Software Cost Total	$ 410,071.10		$88,090.00	
Development Environment to be hosted from Salem, OR	$ 63,214.40		$9,220.00	
Test Environment hosted at Salem, OR				Per Discussion 2/28, Environment not needed, will be setup along with development
COST OF HARDWARE AND SOFTWARE PROCUREMENT	$ 1,089,045.50		$137,953.00	
OPTIONAL SERVICE: Installation and implementation of county hardware (we are not sure if this equipment is already installed in counties)	$ 140,000.00			
Optional Service: Help Desk for issues related to county hardware including desktop, scanner, label printer, printer, barcode reader, etc. including managing third party hardware and software vendor relationships and overseeing product returns and	$ 100,000.00			

New Pricing Options		2007	2008	2009	2010	
Implementation	$ 4,485,000.00	$ 4,485,000.00				
2 Site Hosting	$ 416,640.00	$ 173,600.00	$ 416,640.00	$ 433,305.60	$ 450,637.82	
Platinum Support	$ 725,000.00		$ 725,000.00	$ 754,000.00	$ 784,160.00	
Hardware and Software Procurement	$ 1,089,045.50	$ 1,089,045.50				
Annual Maintenance HW and SW			$80,472.58	$141,401.83	$ 148,471.92	$11,496.08
		$ 5,747,645.50	$ 1,222,112.58	$ 1,328,707.43	$ 1,383,269.74	$11,783.49
		$ 5,747,645.50	**$ 6,969,758.08**	**$ 8,298,465.51**	**$ 9,681,735.25**	$ 12,372.66
Option A = Implementation + 2 Site Hosting	$ 5,747,645.50					
Option B = Option A + Platinum Support for 2008	$ 6,969,758.08					
Option C = Option A + Platinum Support for 2008-2009	$ 8,298,465.51					
Option D = Option A + Platinum Support for 2008-2010	$ 9,681,735.25					

Pricing Assumptions:

For HW and SW, Payment is due as soon as products are received, invetoried, and approval walkthrough list is provided to SOS
Saber will cover all support through 2007 even if the project finishes before the end of the year. For ease of adminsitration, support costs will only start from Jan 1, 2008
Payment for Hosting services begin as soon as service begins to be provided to SOS. The projected date for hosting to start on both sites is Aug 1, 2007.
Annual Maintenance for Hardware and Software is included for the first year from the date of purchase as well as for the option years.
The Projected date for the start of annual maintenance for Hardware and Software is June 1, 2007 - the date when procurement is complete
****Annual Support costs will increase by 4% annually**
Data Center Hosting costs will increase by 4% annually
Annual Maintenance costs will increase by 5% annually but only 2.5% for the first year because of the mid-year start (2008)
User, System, Technical, Third Party Software Documentation is Included at no charge during implementation and if the Saber Support Program is in place
Annual Maintenance is already included for network equipment and third party software and for servers. No annual maintenance fee for Electus; all costs included in SLA based Support Contract

APPENDIX A – LIST OF FUNCTIONAL REQUIREMENTS IN THE BASELINE WYOREG APPLICATION

#	Module	Requirement Description	Baseline WYOREG System	Customization till Dec 2007	Enhancement Phase II
A-1-1	Address Library Management	The system shall provide authorized users with a standard documented method for definition and storage of Address Library (aka Street Index or Locator) information for each of Wyoming's 23 counties.	Y		
A-1-2	Address Library Management	The system shall provide the ability for authorized users to assign an Address Type Code to each address record in the Address Library. This code will indicate the type of address (i.e. Business, Nursing Home, Homeless Facility, Residential, etc.) and whether or not the address or address range is valid for registering voters.	Y		
A-1-3	Address Library Management	When users are entering addresses for registering voters, a warning should appear if the Address Type from the Address Library indicates that the address is not valid for registered voters.	Y		
A-1-4	Address Library Management	The address being entered can then be corrected or the Voter Registration record can be stored in Pending status until an authorized user resolves the conflict between the voter's address and the Address Library.	Y		
A-1-5	Address Library Management	The system's Address Library feature shall be able to handle a large residential complex that has a single street address, but many buildings and units that are potentially dissected by a district or precinct boundary.	Y		
A-1-6	Address Library Management	The system's Address Library management solution shall process a voter registration address accurately (including matching to the correct Address Library record and assigning to the proper district and precinct)	Y		
A-1-7	Address Library Management	The system shall provide authorized users with the ability to look up streets by whole or partial street name.	Y		
A-1-8	Address Library Management	The system must allow a convenient means for the search to be limited to the user's county, to expand to the user's county and surrounding counties, or to be statewide.	Y		
A-1-9	Address Library Management	The system shall prevent deletion of an Address Library address or address range if there are voters in the database with residence addresses that match the address or address range that the user is attempting to delete.	Y		

A-1-10	Address Library Management	The system shall provide authorized users with the ability to generate ASCII-formatted files of the entire Address Library file and user-specified subsets of the entire file (such as all addresses or ranges of addresses in one or more districts, precincts, cities or counties).	Y		
A-2-1	Absentee Processing	1. The system shall have the ability to capture multiple absentee addresses for different time periods. 2. The system will provide the capability for the absentee ballots to be sent to voter's active absentee address if any, otherwise to the mailing address if any, otherwise to the residential address.	Y		
D-1-1	Districts & Precinct File Management	The system shall provide the suitable user roles and privileges to create and delete district and precinct records	Y		
D-1-2	Districts & Precinct File Management	The system shall provide the capability to re-assign voters during the process to add, modify (including split) and delete districts and precincts.	Y		
D-1-3	Districts & Precinct File Management	The system shall have the ability to track the active registered voter total by district or precinct to help meet statutory size requirements	Y		
D-1-4	Districts & Precinct File Management	The district and precinct files/tables shall be available to other system modules (Address Library Management, Voter Registration, Election Management and Petition Management).	Y		
D-1-5	Districts & Precinct File Management	The system shall provide counties with the ability to maintain their own municipality codes and designations in the appropriate database tables, relating them to appropriate addresses and address ranges as required	Y		
D-1-6	Districts & Precinct File Management	The system shall provide the functionality to attach municipality codes automatically to each registered voter if they live in a recognized municipality.	Y		
D-1-7	Districts & Precinct File Management	The system shall provide capabilities to assign specific addresses, street address ranges, and precincts to a variety of political districts.	Y		
D-1-8	Districts & Precinct File Management	The system shall have the convenient and clear ability to assign districts to specific precincts/sub-precincts and the ability to add, update and delete these assignments by authorized users in the counties as necessary.	Y		
D-1-9	Districts & Precinct File Management	The system shall have the ability to create and manage shared districts. The system shall allow any of the counties that share the district to set up an election for the district. All other counties that share the district can share the contests. In case of shared districts, each participating county shall have the ability to certify their own contests. If a county does not certify it, then that issue does not show up on the ballots for that county. The other counties should not be impacted by this.	Y		

D-1-10	Districts & Precinct File Management	The system shall provide the capability to identify changes, collect, and reassign a large number of registered voters (such as all voters in specified precincts or all voters within specified street address ranges) to a new or different jurisdiction	Y		
D-1-11	Districts & Precinct File Management	The system shall provide authorized users the ability to look up districts, precincts, and sub-precincts by user-defined criteria	Y		
D-1-12	Districts & Precinct File Management	The system shall prevent deletion of a precinct if it is associated with any active registered voter(s) or any active Address Library record(s).	Y		
D-1-13	Districts & Precinct File Management	The system shall provide authorized users with the ability to establish individual election jurisdictions and associate the applicable precincts and sub-precincts, if any, which qualify voters to vote in a specific election.	Y		
D-1-14	Districts & Precinct File Management	System shall support District – Precinct naming as defined by W.S. 22-7-105.		Y	
E-1-1	Election Management	The system shall allow set up and generation of the required ballot styles of any type of election at any jurisdictional level.	Y		
E-1-2	Election Management	The system shall generate ballot styles based on residential address and election districts and associate the assigned style to the individual voter record.	Y		
E-1-3	Election Management	The system shall include a full absentee ballot management capability including, at a minimum, the ability to:a) track the date/time a request for absentee ballot was received from any voter,b) record the specific elections for which the absentee ballot was requested,c) track the date an absentee ballot was sent to any voter,d) track the method of delivery of the absentee ballot,e) track the date/time of return of an absentee ballot from a voter,f) track replacement ballot activity,g) track reasons for rejection of absentee ballots from voters	Y		
E-1-4	Election Management	The system shall assist authorized users to manage a complete range of returned ballot activity	Y		
E-1-5	Election Management	The system shall provide the ability to automatically assign ballot style to voters based on specific districts assigned to an election.	Y		
E-1-6	Election Management	The system shall utilize bar code scanning as a primary method for entering data (including at least the voter ID#) from the external face of envelopes or mailing labels on envelopes containing absentee/mail ballots being returned by a voter.	Y		

E-1-7	Election Management	The system shall provide the capability to produce a report that outlines the ballot styles assigned to an election, with the applicable districts for each ballot style and the number of ballots needed for each district and style.	Y		
E-1-8	Election Management	The system shall provide the capability to produce a report that outlines each ballot style with the applicable ballot pages assigned to each ballot style.	Y		
E-1-9	Election Management	The system shall generate the correct ballot style and new address label based on address updates.	Y		
E-1-10	Election Management	The system shall provide authorized users the ability to add, update and delete candidates as they relate to a specific contest, interfaced with the voter registration system to minimize data entry of key information and to validate eligibility to the district. Key information includes, but not limited to: a) name b) address c) phone d) ballot name e) party	Y		
E-1-11	Election Management	The system shall allow users to enter candidate information once and provide the ability to have that information electronically distributed to each identified county and/or district.	Y		
E-1-12	Election Management	The system shall provide the ability to set up a master candidate file that defines all districts and related election contests, such as district names, position numbers, terms of office, number of candidates to vote for count, partisan or not, when the office is next up for election, etc.	Y		
E-1-13	Election Management	The candidate module of the system shall provide the ability to manually override eligibility after receiving an audible or visual warning and enter data if candidate is not within county file.	Y		
E-1-14	Election Management	The system shall provide the ability to run candidate labels from specific election contests.	Y		
E-1-15	Election Management	The system shall provide an authorized user the ability to indicate whether the candidate is on the ballot through paid fee or petition, with a link to petition module if qualifying by petition.	Y		
E-1-16	Election Management	The system shall allow user to create, track and store information for multiple and overlapping elections. The system must allow the definition of multiple elections, at any point in time, per county.	Y		

E-1-17	Election Management	The system shall allow an authorized user to find, update and delete elections. Deletion of an election can mean logical deletion if voter activity is associated with the election.	Y		
E-1-18	Election Management	The system shall provide the ability to select with ease the applicable districts specific to an election.	Y		
E-1-19	Election Management	The system shall provide the ability to select with ease the applicable contests related to the districts specific to an election.	Y		
E-1-20	Election Management	The vendor's system shall allow an authorized user in a county to "certify" and "lock down" an election at the time an election has been certified. The same feature should be available to a statewide user for statewide elections. This "lock down" shall mean that no records pertaining specifically to that election, such as vote history, can be added, modified, or deleted without intervention by an authorized user.	Y		
E-1-21	Election Management	The system shall allow the re-use of election set-up information for current elections (e.g. templates).	Y		
E-1-22	Election Management	The system shall have the ability to define contests related to districts and whether partisan or nonpartisan for primary election purposes.	Y		
E-1-23	Election Management	The system shall allow user to add a new election with all data associated with a particular election including election name, election date, close of registration, hours the polls open/close, start/end of ballot issuing.	Y		
E-1-24	Election Management	The system shall allow the user to run reports specific to a defined election.	Y		
E-1-25	Election Management	The system shall notify the user if at the time of setting up the candidate file for each election, the candidate does not meet the qualification requirements. An authorized user will have the ability to override the alert.	Y		
E-1-26	Election Management	The system shall allow authorized users to query an election by name, year or type.	Y		
E-1-27	Election Management	The system shall have the capability to enter the candidate qualification requirements for each type of position the county conducts elections for (i.e. correct party, filing deadlines, etc.)	Y		
E-1-28	Election Management	The system shall provide for management and assignment of Polling codes (Alpha/numeric) which contains a minimum of the following fields for each poll code: Poll Code, Poll Name, Facility Address, City, State, Zip Code, Main Facility Phone Number, Contact Name, Mailing Address, Contact Phone Number, Rental Fee, Handicap Access (y/n)	Y		

E-1-29	Election Management	The system shall allow for the recording of polling place facility characteristics for compliance with the Americans with Disabilities Act.	Y		
E-1-30	Election Management	The system shall provide the ability to assign one, more than one, or "all" precincts within a county to a polling place for an election.	Y		
E-1-31	Election Management	The system shall have the ability to search for a polling place based on any of the information captured for a polling place.	Y		
E-1-32	Election Management	The system shall allow authorized users in counties to identify, record, and generate reports on polling places used in elections, potential polling places, the available facilities in all polling places, potential polling places, and contact name/phone for polling places.	Y		
E-1-33	Election Management	The system shall allow for cross-reference information such as precincts and polling place Items directly from the polling place screen.	Y		
E-1-34	Election Management	The system shall provide the ability to automatically assign ballot style to voters based on specific districts assigned to an election.	Y		
E-1-35	Election Management	The system shall provide the capability to locally generate a report that lists all voters who submitted more than one ballot in a specified election.	Y		
E-1-36	Election Management	The system shall provide the ability to track and transfer voting history for a specific election to the voters' records.	Y		
E-1-37	Election Management	The system shall provide the ability to record in the voter's record the dates that labels are printed, with the option of processing by individual record or batch.	Y		
E-1-38	Election Management	The system shall provide the ability to record in the voter's record the date ballots are mailed, with the option of processing by individual record or batch.	Y		
E-1-39	Election Management	The system shall provide the capability to produce a ballot style of the ballot that can be exported to a printer or vendor in various formats.	Y		
E-1-40	Election Management	The system shall provide the ability to enter voter activity for an election through data entering the identification numbers and/or scanning bar code	Y		
E-1-41	Election Management	The system shall provide the ability to verify that the person is registered to vote and meets all voting availability requirements	Y		

E-1-42	Election Management	Candidate Administration: The system shall provide authorized users the ability to add, update, withdraw and delete candidates as they relate to a specific office, interfaced with the voter registration system to minimize data entry of key information and to validate eligibility to the district.Key information includes:a) nameb) addressc) phoned) ballot namee) party	Y		
E-1-43	Election Management	The system shall allow user to enter candidate information once and provide the ability to have that information parsed out to each identified county and/or district.	Y		
E-1-44	Elections Management	The system shall include a full absentee ballot management capability including, at a minimum, to: a) track the date/time a request for absentee ballot was received from any voter, with the ability to auto-fill field with current date b) provide the capability for the user to enter an absentee ballot request for a voter for any election at any time c) track the date an absentee ballot was sent to any voter, with the ability to auto-fill field with current date d) track the method of delivery of the absentee ballot, e) track the date/time of return of an absentee ballot from a voter, with the ability to auto-fill field with current date f) track replacement ballot activity, g) track reasons for rejection of absentee ballots from voters, h) track status of absentee ballot request (i.e. faxed request, need original, not registered, health care facility, etc.), i) assign a political party affiliation to a voter's absentee request for any primary election.	Y		
E-1-45	Elections Management	The system shall provide the ability to select the way in which the absentee ballot was requested (by mail, over-the-counter, satellite, etc.)	Y		
E-1-46	Elections Management	System shall issue absentee ballots for voters who register in the 30-day period of an election and mark them as absentee voted in poll books		Y	

E-1-47	Elections Management	System shall provide voting credit for absentee voters who have returned their absentee.	Y		
E-1-48	Elections Management	System shall maintain an absentee record per W.S. 22-9-108.		Y	
E-1-49	Elections Management	System shall be able to issue more than one absentee ballot to a voter and have the ability to keep track of which ballot is returned		Y	
E-1-50	Elections Management	System shall be able to generate two different types of absentee labels for an absentee ballot. One label will have absentee ballot mailing address and the other label will have ballot tracking barcode.	Y		
E-2-1	Election Workers	The system shall provide a clearly defined and documented function to support management of election workers in individual election offices.	Y		
E-2-2	Election Workers	The system shall track an election workers work related details for an election such as the political party, work precinct and job type.	Y		
E-2-3	Election Workers	The system shall provide the users with the ability to search election workers by jobs, location, political party and precincts.	Y		
E-2-4	Election Workers	The system shall track an election worker's details for election related communications (election worker's mailing address and residential address). The system shall provide the capability for an authorized user to be able to regulate the election worker communication.	Y		
E-2-5	Election Workers	The system shall provide the capability to integrate an election worker record to a voter's record.	Y		
E-2-6	Election Workers	The system shall provide authorized users in any county the ability to prepare reports on valid pay rates and mileage rates for election workers in an election. Each county establishes its own election worker pay rate schedule.	Y		
E-2-7	Election Workers	The system shall have the option to prepare compensation files on demand for transmission to county payroll systems for processing.	Y		
E-2-8	Election Workers	The system shall provide authorized users with the ability to enter at a single line (containing at least 80 characters) of free-text information about each election worker. This free-text information shall be in addition to any other free-text "notes" or "comments" entered about election workers who are registered voters.	Y		
E-2-9	Election Workers	The system shall provide notification if the party affiliation changes on an Election Worker's voter registration record and the Worker has been assigned to work an election. This is to ensure that the proper affiliation mix of Election Workers is maintained at the polling place.	Y		

E-2-10	Election Workers	The system maintains the worker records throughout the lifetime of an election worker, and the system shall automatically track a worker's "work history" when the election worker/voter moves from one location to another.	Y		
E-2-11	Election Workers	The system shall have the option to denote the usual work location of individual election workers for an election.	Y		
E-2-12	Election Workers	The system shall have the option to denote the normal type of work performed by an election worker.	Y		
E-2-13	Election Workers	The system shall track training sessions attended by election workers.	Y		
E-2-14	Election Workers	The system shall provide authorized users in counties with the ability to enter the nine-digit SSN to be used for election workers payroll identification. The SSN is required for Election Worker payments.	Y		
E-2-15	Election Workers	System shall allow underage election workers who are not registered voters.		Y	
Q-1-1	Queries and Reports - General	The system shall provide for a "full text search and retrieval" of comment and note fields in the voter registration and election management records that meet entered text string criteria in the searches.	Y		
Q-1-2	Queries and Reports - General	The system shall provide the capability for authorized users to search voter registration records using both "exact match" and "wildcard" search functions. Search criteria shall be allowed, at a minimum, in the fields for primary name, alternative names, date of birth, SSN, voter identification number, driver license number, addresses, precinct and district.	Y		
Q-1-3	Queries and Reports - General	The system shall provide data export capability and shall be available "on demand".	Y		
Q-1-4	Queries and Reports - General	The system shall provide authorized users with a library of standard, pre-defined reports.	Y		
Q-1-5	Queries and Reports - General	The system shall provide the ability for authorized users to generate a printed report of suspected duplicate voter registration records using user-defined criteria.	Y		

Q-1-6	Queries and Reports - General	The system shall provide authorized users with the capability to produce electronic files in ASCII format (selecting either delimited or fixed-width layout) that will contain (a) all data or (b) any user selected data elements (such as only the full name, sex, and full address) of all registered voter records. After creating such a file, the authorized users will develop, at their discretion, the capability to copy the file to diskette, tape, or CD-ROM or to transmit the file to another operating system. The system shall provide the ability for authorized users to select various options to filter (such as all voters who voted in the last November Federal general election) and sort (such as alphabetic by voters' last name or by any political jurisdiction in which the voters reside) the data that is selected and output to such output files.	Y		
Q-1-7	Queries and Reports - General	The system shall have the capability to print a transaction report by user per session. This report will be used to validate data entry with the original documents.	Y		
Q-1-8	Queries and Reports - General	The system shall provide authorized users with an additional 100 custom reports, prepared for use in Wyoming's state and county election offices. These reports shall be available interactively and in batch mode. The custom reports and other output shall provide authorized users with selection options to filter or sort by any political jurisdiction. The 100 custom reports shall be identified and approved by Wyoming's election officials during the detailed, technical design phase of the implementation project.	Y		
Q-1-9	Queries and Reports - General	The system shall allow authorized users to (a) generate any system report and to output that report to a PDF file and (b) route and store that generated PDF file in a specified server directory available to the user who generated the file.	Y		
Q-1-10	Queries and Reports - General	The system shall allow the user to generate reports and view them on the screen, with actual and accurate data, prior to deciding to print the report. The system shall also allow the user the ability to print selected pages of the report.	Y		
Q-1-11	Queries and Reports - General	The system shall provide the ability to generate both (a) a file for use by a mailing house/printer and (b) printed confirmation cards to every registered voter whose ballot is returned as undeliverable.	Y		

Q-1-12	Queries and Reports - General	The system shall provide the ability for authorized users to generate files and reports containing registered voter counts statewide, by district, and in any county by precinct and precinct portions (splits).	Y		
Q-1-13	Queries and Reports - General	The system shall allow the user to generate reports and view them on the screen prior to deciding to print the report. The system shall also allow the user the ability to print selected pages of the report.	Y		
Q-1-14	Queries and Reports - General	The system shall have capability for all reports to have date and time at which the report ran in the header or footer.	Y		
Q-1-15	Queries and Reports - General	The system shall provide the capability to do canned Public Service Request (PSR) extracts at the county level and at the state level: **County level PSRs:** 1. Counties shall be able to create a tab-delimited text PSR file for any congressional district 2. - For counties, they should be able to create a tab-delimited text PSR file for their entire county **State level PSRs:** 1. State shall be able to create a statewide tab-delimited text PSR file for any Congressional district 2. State shall be able to create a statewide tab-delimited text PSR file	Y		
S-1-1	System Requirements	The system shall allow authorized state/county staff to add, modify and delete data elements in “lookup tables” used by the system and the database management system. This should be restricted to tables that contain values to be stored in the database only and not containing values to be used in internal system program logic.	Y		
S-1-2	System Requirements	The system shall allow for a batch to be closed out before process completion and re-opened and completed by different users.	Y		
S-1-3	System Requirements	The system shall provide solutions that are in compliance with the voter registration and election operations mandated by Wyoming election laws.	Y		
S-1-4	System Requirements	The system shall provide solutions that are in compliance with the requirements of the Help America Vote Act of 2002	Y		
S-1-5	System Requirements	The system shall utilize a phonetic type (for example Soundex) search capability.	Y		
S-1-6	System Requirements	The system shall support storage of null values in data fields where null is an accepted value.	Y		
S-1-7	System Requirements	The system may contain OCR functionality that supports major brands of scanners.	Y		

S-1-8	System Requirements	The system shall be fully functional on workstations that have the desktop suite software concurrently loaded with the system.	Y		
S-1-9	System Requirements	The system shall not adversely impact the operation of the concurrently loaded desktop suite software.	Y		
S-1-10	System Requirements	The system shall have scalability for a potential expansion of up to 50% in the number of state/county users.	Y		
S-1-11	System Requirements	The system shall provide the ability to store an unlimited number of records containing voter's name, address and voting history.	Y		
S-1-12	System Requirements	The system shall support local desktop scanning of documents.	Y		
S-1-13	System Requirements	The system shall support local desktop printing.	Y		
S-1-14	System Requirements	The system shall allow the use of drop-down lists that are populated from values in a database table. These table values should be updatable by appropriately authorized users. The drop-down selection feature should allow selection of a value by clicking the value or allow typing of the value with type-ahead capability (field is populated with next table entry that matches the letters that have been typed).	Y		
S-1-15	System Requirements	The system shall provide users with clear and useful error messages from an error-handling module.	Y		
S-1-16	System Requirements	The system shall provide users with clear and useful warning, informational and notice messages.	Y		
S-1-17	System Requirements	The system shall have the capability to provide public access screens for the general public to walk into an election office to view applicable voter registration information in a self-service capacity.	Y		
S-1-18	System Requirements	The system shall have screens with a consistent look, feel, object location, and navigation across modules.	Y		
S-1-19	System Requirements	The system shall provide standard data entry edit checking and automatic data formatting.	Y		
S-1-20	System Requirements	The system shall have the ability for entry, storage, processing and display of dates using an eight-digit field: (mm/dd/yyyy).	Y		
S-1-21	System Requirements	The system's software modules (address library, district/precinct, elections, petitions and voter registration) must be integrated such that a user, with appropriate security authorization, can move directly to a module without having to exit current work being performed.	Y		

S-1-22	System Requirements	The system shall include an online, indexed "help" capability to assist users and administrators in finding information relative to system and application functions and operations.	Y		
S-1-23	System Requirements	The system shall provide the capability for what is normally called "auto-fill" for automatically completing data entry on select fields.	Y		
S-1-24	System Requirements	The system shall provide a high level of confidentiality and integrity of the statewide and county-specific data. Data in all modules of the system will have adequate security to ensure correct county access. This includes, but is not limited to: 1. Provide role-based security, including the ability to define both individual and group access to data and application functions. 2. Allow authorized election officials full access to data and functions for their jurisdiction and read access to all other jurisdictions. 3. Local election officials must be allowed to act as security managers for their jurisdictions, controlling access rights and privileges for their local election office users	Y		
S-1-26	System Requirements	The system shall provide users with warning, informational and notice messages. User should be able to access a Help function to obtain further instructions related to a message being displayed.	Y		
S-1-27	System Requirements	The system shall include an online, indexed “help” capability to assist users and administrators in finding information relative to system and application functions and operations.	Y		
S-1-28	System Requirements	The system shall provide users with clear, human readable error messages. The system shall provide users with clear and useful warning, informational and notice messages.	Y		
S-1-29	System Requirements	The application will be accessible over the internet via the Citrix client using Internet Explorer.	Y		
S-1-30	System Requirements	The system shall provide a high level of availability. Regularly scheduled down time shall not exceed 5 hours per day for maintenance.	Y		
S-1-31	System Requirements	The software shall be fully functional during peak system usage, one month prior to and one month following an election, and all downtime shall be prohibited during normal business hours.	Y		

S-1-32	System Requirements	The system shall have the ability to transfer information for various functions, such as: -Data Export to Counties -Data Import from various state agencies	Y		
S-1-33	System Requirements	The system shall provide for optimal load balancing and fault tolerance distributed over multiple servers	Y		
S-1-34	System Requirements	The system changes shall include complete application and end user documentation that will be delivered and considered an integral part of the system	Y		
S-1-35	System Requirements	The system shall allow multiple users to simultaneously perform search operations, report generation, printing, modifications and deletions at peak load periods	Y		
S-2-1	System Administration	The system shall provide the county application administrator with ability to create, edit and manage city names, street names for various addresses that may be used in the system	Y		
S-2-2	System Administration	The system shall allow field-level security at the user level. For example, certain users may not have authority to modify particular fields on a screen, while other users might have the authority.	Y		
S-2-3	System Administration	The system shall support security such that a county user's read and write access can be restricted to Address Library, Precinct/District, Election, and Voter Registration records. Most typically, a county user will have read/write access to one or more of these type records within their county, but read only access to one or more of these type records in other counties.	Y		
S-2-4	System Administration	The system shall allow the state application administrator with the capability to define/create, edit and manage a) street types b) Street directions c) Absentee Types d) Source of Registration	Y		
S-2-5	System Administration	The system will have functionality to purge (permanently remove) voter records from the system. This will be a privilege controlled by the state application administrator.	Y		
S-2-6	System Administration	The system should be able to produce a report on voters who are eligible to be purged grouped by counties (Purge-Eligible Report). The system shall also generate a notification listing purge-eligible voters by county	Y		
S-3-1	System Security	The system will have the capability to prevent unauthorized attempts to penetrate the system and unauthorized procedures by authorized users	Y		

S-3-2	System Security	The system shall support automated application password expiration at intervals specified by a central system administrator.	Y		
V-1-1	Voter Registration	The system shall provide the capability to automatically track the voter correspondences generated for voters. The system shall provide the user with the capability to define the conditions for the auto-generation of voter correspondences	Y		
V-1-2	Voter Registration	The system shall provide unique identification numbers for all registered voters. This unique ID number will follow the voter from county to county.	Y		
V-1-3	Voter Registration	The system shall allow for optional entry and display of a voter's "Mailing" and "Absentee" address using the following fields:a) Free-form data entryb) Fields long enough to meet US postal, foreign and military mail regulationsc) Postal codesd) Countrye) Beginning and end dates for use of absentee address.	Y		
V-1-4	Voter Registration	The system shall allow authorized users to enter an indicator showing that research on a duplicate is being performed and the name being researched may not be legitimate.	Y		
V-1-5	Voter Registration	The system shall display accurately the current status of each registered voter on as many relevant display screens as practical, including but not limited to: a) Voter registration data entry screens, b) Absentee voting screens, c) Ballot Processing screens, and d) Voter history screens. In addition to displaying the status, the proposed system shall display the status with a color-coded background that clearly distinguishes registered voter with an "Active" status, an "Inactive" status, and a "Deleted" status.	Y		
V-1-6	Voter Registration	The system shall have the ability for entry, storage and display of user-defined registered voter/applicant's "reason codes".	Y		
V-1-7	Voter Registration	The system shall have the ability for entry, storage and display of user-defined registered voter/applicant's "party code".	Y		
V-1-8	Voter Registration	The system shall allow the user to display data on existing registered voters, as well as modify existing records without re-entering existing data.	Y		

V-1-9	Voter Registration	The system shall allow the user to add data on newly registering voters.	Y		
V-1-10	Voter Registration	The system shall provide the following “parsed” residence fields:a) House numberb) House fraction numberc) House number suffix (alpha/numeric)d) Two digit pre-directional code (i.e. S., SW)e) Street name (alpha/numeric)f) ‘Alias’ street name (alpha/numeric)g) Type (i.e. Street, Road, Lane)h) Two digit post directional codei) Apartment or space number (alpha/numeric)j) Unit Typek) Cityl) Zipm) Zip plus four (option)	Y		
V-1-11	Voter Registration	The system shall provide the ability for an authorized user to add, modify and delete absentee voter codes. The allowable absentee voter codes will be standardized across the state, stored in a database table, and presented in a screen dropdown box.	Y		
V-1-12	Voter Registration	The system shall have the ability for entry, storage, processing and display of a registered voter/applicant’s status code (at a minimum the following codes: active, inactive, cancelled, and pending).	Y		
V-1-13	Voter Registration	The system shall provide the capability for authorized users to search through alternative names and primary name records.	Y		
V-1-14	Voter Registration	The system shall retain previous last name(s) in the voter history record and shall optionally display them in duplicate voter and voter history search results.	Y		
V-1-15	Voter Registration	The system shall provide the users with definable user roles and privileges so that only privileged users with authorized access shall be will be able to view and work with voter records belong to 'confidential' status.	Y		
V-1-16	Voter Registration	The system shall have the ability to automatically assign a voter to the correct precinct and districts.	Y		
V-1-17	Voter Registration	System shall accept rural residential address. For example, a registered voter's address in a county might be "Mile Marker 29.5, Hwy. 85".	Y		

V-1-18	Voter Registration	When a voter moves within Wyoming, the system shall recognize that this is an internal move and treat it as a record update, not a new registration. Voter history must be maintained.	Y		
V-1-19	Voter Registration	The system shall maintain unlimited voter history for active voters, regardless of the number of elections in which voters might have participated during that 10-year period.	Y		
V-1-20	Voter Registration	The system shall provide a clearly defined and documented procedure to check for duplicate voter registrations.	Y		
V-1-21	Voter Registration	The system shall provide the ability for authorized staff to add, modify and delete assignable political party codes.	Y		
V-1-22	Voter Registration	The system shall capture and report on type of registration transaction user-defined code being applied.	Y		
V-1-23	Voter Registration	At the time of data entry the system shall automatically enter, store, and display the current county of the voter's residence as established during data entry or data modification. The system shall display the existing county code and county name.	Y		
V-1-24	Voter Registration	The system shall maintain voter mailing addresses in United States Postal Service (USPS) standard address format.	Y		
V-1-25	Voter Registration	If the address update has the effect of moving a voter's registration to a new county, the system shall send an electronic notification to the county from which the voter registration has been transferred.	Y		
V-1-26	Voter Registration	During data entry the system shall allow the data entry operator to enter the date on which the change is/was effective.	Y		
V-1-27	Voter Registration	The system shall allow the state/county to determine, track, and note in the registration and election management system whether a voter requires special assistance at the polls.	Y		
V-1-28	Voter Registration	The system shall have the ability for entry, storage, processing and display of a voter's prior county using existing county code and county name, as well as prior state. The prior state shall be in the two-character USPS state code of the state in which the registered voter previously resided	Y		
V-1-29	Voter Registration	The system shall provide the ability to add comments or notes to a voter record using a free-form text field with a minimum of 1024 characters.	Y		

V-1-30	Voter Registration	The system shall provide the capability to capture the following dates: a) The original date of registration b) The effective date of last update to record c) The system transaction date when a record is added or changed.	Y		
V-1-31	Voter Registration	The system shall have the capacity to automatically assign voters to the correct districts and precinct when the voter's residence address is entered.	Y		
V-1-32	Voter Registration	If a voter's address cannot be located in the Address Library, the voter registration record shall be placed in a "Pending" status until the entered voter address is corrected to match an existing Address Library entry or the Address Library is updated to include the voter's address. This feature shall allow voter registration entry to continue, even though voter addresses are not found in the Address Library.	Y		
V-1-33	Voter Registration	The system shall provide the ability to enter for each registered voter at least one "alternative name." For example, an alternative name might be a maiden name or a different spelling of the voter's name.	Y		
V-1-34	Voter Registration	The system shall provide the ability to display on the main voter registration window an indicator that the voter has an alternative name. The system shall provide users with a "hot key" or other rapid ability, acceptable to the Secretary of State, to display the alternative name.	Y		
V-1-35	Voter Registration	The system shall provide a color-coded visual notification on all display screens that indicates the person is not of voting age at the time of the display.	Y		
V-1-36	Voter Registration	The system shall allow the user to display data on existing registered voters, as well as modify existing records without re-entering existing data. The display of the data shall include the most recently stored digitized signature of the registered voter.	Y		
V-1-37	Voter Registration	The system shall allow an authorized user to enter and modify data on a registered voter, whether or not there is a scanned image of voter registration forms or digitized signature image to commit to the database and attach to the voter registration record. This requirement means that in the event the scanning capability is not available for any reason, the system will allow entry and modification of data about an applicant or registered voter.	Y		

V-1-38	Voter Registration	The system shall allow entry and display of voter names using the following parsed fields: a) Suffix (Sr., Jr., other generations) b) First name (full or initial) c) Middle name (full or initial) d) Full last name (can include hyphenated last name) e) Previous name(s) f) Alternate name	Y		
V-1-39	Voter Registration	The system shall have the capability to retrieve batches of voter registration applications in the order in which they were scanned or entered.	Y		
V-1-40	Voter Registration	The system shall have the capability to place the corresponding batch number on the individual voter record and to store the batch number in the voter's electronic record.	Y		
V-1-41	Voter Registration	The system shall provide a queue management capability that will allow sequential ordering of batches for processing. This requirement means, for example, that an authorized user can locate a minimum of three batches and arrange and rearrange the order in which the batches will be selected for processing and data entry	Y		
V-1-42	Voter Registration	The software shall provide for "at least" the following capabilities during data entry of a new voter registration application or modification of an existing voter registration record: (a) automatic calculation of voter age, (b) default entry of the residential address as the mailing address (with ability of the data entry clerk to accept or override the default entry), and (c) default entry of the system date as the date of data entry (with ability of the data entry clerk to accept or override the default entry).	Y		

V-1-43	Voter Registration	The system shall provide the ability to receive bar code data as input into the database through a reasonable number of fields on the voter registration and election management data entry and update forms. This capability shall be designed for use by Wyoming's election officials in entering, at a minimum, (a) voter activity data from poll books or other election documents, (b) data on returned ballots, and (c) bar code data printed on other voter registration and election management materials.	Y		
V-1-44	Voter Registration	The system shall perform edits to check for duplicate voter registrations. Before a voter registration record is accepted, a matching algorithm must be performed to help ensure the potential registrant does not already exist in the database. If the system identifies a potential duplicate, the user must be notified and provided the applicable information to perform research to make a determination on the accuracy of the duplicate notice. The user must have the ability to override the error if they determine the record is NOT a duplicate.	Y		
V-1-45	Voter Registration	The system shall provide the capability to “merge” two (or more) voter registration records for the same individual and preserve all information including the voter transaction and election vote history information for the two (or more) merged records, regardless of whether or not there are multiple counties involved in the records merger. The system shall provide a documented method, satisfactory to state/county staff and in compliance with the Federal and state voter registration reporting requirements, to merge data from the separate records into a single registration record for an individual voter.	Y		
V-1-46	Voter Registration	The system shall allow duplicate records that were merged together erroneously to be “un-merged”. For example, if voter A and voter B were determined to be duplicate and were merged together and identified as voter B and then it was determined that the merge was in error, the user would need a convenient way to restore voter A and voter B records to show two distinct voters.	Y		

V-1-47	Voter Registration	The system shall facilitate auto fill of voter registration information at the time of registration and during entry of a valid residential address. For instance, once the street address is entered, the system should be able to determine from the Address Library the one or more cities and zip codes that relate to the street address. If there is only one corresponding city and zip, then those fields should be automatically filled. If there is more than one possibility, a drop down of those possibilities should be available to choose the correct value.	Y		
V-1-48	Voter Registration	The system shall retain in its transaction audit log the User ID of the user who made each change	Y		
V-1-49	Voter Registration	The User ID of the user who made the last change to any part of the registered voter's record shall be displayed somewhere on the main voter registration display screen.	Y		
V-1-50	Voter Registration	The system may allow the flagging of two or more voter registration id's as not being duplicates of each other. The reason for this requirement is to reduce the number of false positives when creating a list of potentially duplicate voter registration records. Once sufficient research has been completed to know that two specific id's are not duplicates of each other, an authorized user could flag the two or more records in a way that will prevent the flagged records from showing up as duplicates of each other in future duplicate record searches.	Y		
V-1-51	Voter Registration	When Wyoming Drivers License Number is entered system shall validate the number with the WY DOT data. If the number is found, the system will compare applicable data between the two systems. The record should also updated with the date the number was validated.	Y		
V-1-52	Voter Registration	If the SSN (or last 4 digits) is entered, the system will verify the SSN digits of the applicant's voter registration record against data in the Social Security Administration database. If the number is found, the system will compare applicable data between the two systems. The record should also updated with the date the number was validated.	Y		
V-1-53	Voter Registration	The system shall provide a method to periodically obtain an extract of death information in collaboration with the Department of Health.	Y		
V-1-54	Voter Registration	The system may process felon data from Department of Corrections interface and attempt to match with existing voter registration records. When a match is found, the system will identify the record as a potential match, so the authorized user may change the status to "Cancelled" and set the reason code to "Convicted Felon".	Y		

V-1-55	Voter Registration	The system shall provide the ability to produce household labels based on user-defined address criteria.	Y		
V-1-56	Voter Registration	The system shall be able to identify, in the poll book, voters who have returned absentee ballots prior to election day, if required.	Y		
V-1-57	Voter Registration	The system shall provide the ability to record in the voter's record the dates that labels are printed and the date ballots are mailed, with the option of processing by individual record or batch.	Y		
V-1-58	Voter Registration	The vendor shall propose a method for providing online access for registered users to a daily extract of selected system data such as name, address, original registration date, date of birth, party, district number and phone number.	Y		
V-1-59	Voter Registration	The system shall, when checking for potential duplicates, allow all pending records in all counties to be included in the check.	Y		
V-1-60	Voter Registration	The system shall provide for a "full text search and retrieval" of comment and note fields in the voter registration records that meet entered text string criteria in the searches.	Y		
V-1-61	Voter Registration	The system shall allow users to display individual voter registration record data including registration card and signature images by selecting from any on-screen summary listing of voter records.	Y		
V-1-62	Voter Registration	The system shall allow authorized users to print one or multiple address label(s) of a registered voter or applicant whose record is displayed in the current window.	Y		
V-1-63	Voter Registration	The system shall provide direct envelope printing and address file extraction for third party printing.	Y		
V-1-64	Voter Registration	The system shall provide the ability to run supplemental labels after the main label run for any voter that has been added or had a registration change since the original labels were issued.	Y		
V-1-65	Voter Registration	The system shall support the automated entry of data, via bar code reading, at the desktop. For example, the bar code reading of voter information from mailing labels.	Y		
V-1-66	Voter Registration	The system shall have bar code scanning capabilities that is compatible with commercially available bar code equipment.	Y		

V-1-67	Voter Registration	The system shall provide the ability to (a) extract ("clip") the digitized signature images from digitized voter registration forms, (b) associate accurately each digitized signature image with the correct voter registration record, (c) load the digitized signature image into the database, and (d) make the digitized signatures available to authorized users for search, retrieval, and display.	Y		
V-1-68	Voter Registration	The system shall provide the ability to track any changes that are made to a voter record, including a. The change madeb. The column changedc. The user who made the changed. The time and date the change was madee. Comments, if any input by the user making the change	Y		
V-1-69	Voter Registration	System shall provide a functionality to send all eligible voters who did not vote in a particular election a piece of specific correspondence.	Y		
V-1-70	Voter Registration	System shall provide a functionality to move all the eligible voters who did not vote in a general election and who did not respond to the correspondence to 'Cancelled' status.		Y	
V-1-71	Voter Registration	System shall provide a voter purge functionality.		Y	
V-1-72	Voter Registration	Voters in Wyoming have the option of Election Day registration, so relatively few provisional ballots are actually cast. However, the system does need the ability to capture and track provisional ballots.		Y	
V-1-73	Voter Registration	System shall provide the capability to enter effective registration date which can be backdated,	Y		
V-1-74	Voter Registration	System shall not update effective registration date because of mailing any correspondence	Y		
V-1-75	Voter Registration	System shall have the ability to capture Source of Registration. The various sources are a. County Clerks b. Municipal Clerks c. Tribal Clerks d. Election day	Y		

V-1-76	Voter Registration	System shall have the fields to capture various information collected on Wyoming Voter registration application as per W.S. 22-3-103 including the reference identification requirements.		Y	
V-1-77	Voter Registration	System shall be able to capture political party affiliation of a voter. A voter can be associated only to a major political party. When a major political party loses its recognition to be major all the voter affiliated to this party shall be moved to 'Other' party. The system shall not lose the actual affiliation of the voter as when the party regains its recognition as major party system should move all the voters from other to the actual party.		Y	
V-1-78	Voter Registration	System shall allow users to scan multiple types of documents and clip signatures from them.	Y		
V-1-79	Voter Registration	System shall provide the functionality to the users to enter the VR info, print a voter registration form in a report format, get it signed by the voter, and scan it in to the system.		Y	
V-1-80	Voter Registration	System shall comply with statutory requirements for voter registration list as specified in W.S. 22-3-108.		Y	
V-2-1	Voter Search	The system may allow each user the ability to change search options when searching for voters who might fit in various categories. For example, the user may want to search for a voter by using a minimal amount of data or by using several data fields.	Y		
V-2-2	Voter Search	The system shall allow users to search voters by 1. Districts 2. Precincts 3. Political party 4. Voting activity 5. Residential address 6. Mailing address 7. Name, DOB, Gender, SSN, DL, etc.	Y		
P-1-1	Petitions Management	The system shall provide the ability to manage and check petitions for petitions of type initiative, referendum, recall, and candidate.	Y		
P-1-2	Petitions Management	The system shall provide the ability to setup a petition for the checking process with information including the petition number, a brief text description of the petition, the petition received date, the circulation start date, the circulation end date, number of signatures required, number of signatures submitted, and the valid jurisdiction for that petition.	Y		

P-1-3	Petitions Management	The system shall provide authorized users the ability to view the date of registration, name, address, digitized signature, confirmation of registration status, the effective date of the digitized signature image, and qualified district for petition signers and candidates by petition.	Y		
P-1-4	Petitions Management	The system shall provide authorized users in a county election office the ability to record in a registered voter's record an indication that the voter has signed a specific petition	Y		
P-1-5	Petitions Management	The system shall display warning messages to the users if the voter has already signed the petition (duplicate signature identification) through screen prompts and alerts to the user.	Y		
P-1-6	Petitions Management	The system shall provide authorized users the ability to accept or reject petition signatures during the verification process and record the reason for each rejection.	Y		
P-1-7	Petitions Management	The system shall provide authorized users with ability to (a) generate samples through a procedure to select signatures to verify (b) produce a selection of pages and lines to check for random sampling of signatures on any selected petition as required by county election officials (c) add/generate additional new samples for a submittal so that users can increase the size of a submittal is available until processing of the petition signatures has begun (d) add single petition lines to a sample increasing the size of the sample without having to recheck the petition signatures that are already checked	Y		
P-1-8	Petitions Management	The system shall provide the petition statistics for a petition which includes the fields - number of signatures accepted, number rejected etc. This shall be provided at the districts level.	Y		
P-1-9	Petitions Management	The system shall allow the capability for petitions to be grouped for a office (for different candidates)	Y		

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APPENDIX B – PROJECT TEAM RESUMES

Paddy Joseph McGuire

Vice President of Elections

PROFILE

Mr. McGuire joined Saber in early 2007 as the Vice President of Elections, after nearly twenty years in state and federal government. In this time, he served as Oregon's Deputy Secretary of State overseeing the Elections Division, Senior Policy Advisor at the Bonneville Power Administration, Director of the Office of Intergovernmental Affairs, Chief of Staff to the Deputy Secretary for the U.S. Department of the Interior, and Legislative Liaison and Chief of the Public Communication Section for the Alaska Department of Fish and Game. He is a graduate of Hamilton College in Clinton, NY and the Senior Executives in state and local government program at the Kennedy School of Government at Harvard. At Saber, Mr. McGuire is the primary point of contact for our elections customers, working to ensure that our client partners are satisfied.

EXPERIENCE

Saber

Role: Vice President of Elections **01/07 – Present**

As Vice President of Elections, Mr. McGuire is the primary point of contact for our elections customers, working to ensure that clients are satisfied.

Oregon Secretary of State

Role: Deputy Secretary of State **11/00 – 12/06**

As Deputy Secretary of State, Mr. McGuire managed the day-to-day operations of complex and diverse 200-employee, $44 million enterprise. He had full, legal, delegated authority to act on behalf of the Secretary of State and was responsible for development and implementation of agency policy, strategic plan, budget and proposed bills submitted to the Legislature. Mr. McGuire led the agency Management Council, consisting of seven division directors, including a state Elections Director, Auditor and Archivist. He oversaw the Elections Division, ensuring implementation of the Help America Vote Act and State election law. He served as the only American on Direct Democracy Workgroup for the Institute for Democracy and Electoral Administration in Stockholm, Sweden.

Role: Chief of Staff **01/00 – 11/00**

Mr. McGuire managed the Executive Office for Oregon's second highest-ranking Constitutional Officer, Secretary of State Bill Bradbury. He provided high-level policy advice to the state's Chief Elections Officer, Auditor of State Account and member of the State Land Board that manages two million acres of land to benefit the common school fund. He worked closely with the directors of the seven divisions the Secretary oversees to ensure continuity of policy. In addition, Mr. McGuire acted as liaison to the Governor's office, the Legislative Assembly and to other Constitutional officers.

Bonneville Power Administration, U.S. Department of Energy

Role: Senior Policy Advisor **07/98 – 01/00**

Mr. McGuire was responsible for Bonneville's external communications, public outreach and intergovernmental relations efforts. He reviewed and made recommendations to resolve substantive program and policy issues arising within the agency and assessing their impacts outside the agency. He provided high-level policy advice to the Administrator so that she could make better-informed decisions with a full understanding of the implications and impacts of those decisions. He also worked with elected officials throughout the Pacific Northwest and acted as agency liaison to organized Labor.

U.S. Department of the Interior

Role: Director, Office of Intergovernmental Affairs **01/97 – 07/98**

Mr. McGuire was responsible for the coordination and contact between the Department and all non-federal elected officials. He served as the Secretary's liaison and represented the Department to the National Governors Association, National Association of Counties and similar organizations. He conducted government-to-government consultations with Native American Tribes and handled issues that were contentious and subject to intense public scrutiny and possible litigation. Additionally, Mr. McGuire managed staff and office budget, and served as a senior policy advisor to Secretary Bruce Babbitt.

Clinton/Gore '96

Role: Oregon State Director **08/96 – 11/96**

Mr. McGuire planned and directed a successful campaign and had overall authority for all aspects of the reelection effort in Oregon. He worked closely with national pollster and media consultants on a strategy for victory and spoke on the record on behalf of campaign. Mr. McGuire acted as liaison to elected officials and the national campaign and supervised the Oregon campaign staff. He was responsible for political decisions related to visits by the President and Vice President. He also prepared briefing materials and briefed the President and the Vice President on the political climate in Oregon.

U.S. Department of the Interior

Role: Chief of Staff, Office of the Deputy Secretary 08/95 – 08/96

Mr. McGuire directed and supervised the staff of John Garamendi, the number two person at the Department. He planned and managed the Deputy Secretary's calendar, oversaw the outreach to constituencies, managed office budget and directed paper flow. He served as liaison to the Secretary's Office, the White House and other Federal agencies and conducted government-to-government consultations with Tribes on behalf of Federal government. Mr. McGuire was directly involved in the implementation of the President's Forest Plan in the Northwest and application of the Endangered Species Act in California, Oregon and Washington.

Role: Dir. of the Exec. Secretariat/Special Assistant to the Secretary 06/93 – 08/95

Mr. McGuire managed correspondence response and paper flow for the Secretary. He oversaw responses to 250 pieces of Secretarial correspondence per day. He directed flow and approved all written material given to the Secretary. He prepared briefing material for Secretary for all of his meetings and travel and wrote weekly memorandums on Departmental activities for the President. In addition, he prepared memoranda on Departmental activities and programs for all Presidential travel. Mr. McGuire managed a staff of sixteen and an annual budget of $1.2 million.

Clinton/Gore '92 Committee

Role: Oregon State Director/Oregon Political Director 03/92 – 12/92

Mr. McGuire planned and directed successful Primary and General election campaigns. He acted as liaison with elected officials and party leaders, established and coordination constituency groups, and advised the national campaign on matters of policy. He acted as spokesperson for campaign before local and national news media and in public forum. He prepared issue briefings for the candidate, directed fund raising and managed the budget. He also developed and executed a free media plan and assisted in the selection of paid media and direct mail.

Democratic Party of Oregon

Role: Executive Director/Political Director 02/88 – 03/92

Mr. McGuire had overall management responsibility for a 22,000 contributing member organization. He directed fund raising, exercised fiduciary control and supervised staff. He acted as liaison with elected officials and other entities and as spokesperson to news media, the Legislature and in public forum. Mr. McGuire increased small donor contributions by 150 percent and large donor income by 500 percent.

Stephen McAlpine for Lieutenant Governor Committee

Role: Campaign Manager 04/86 – 11/86

Mr. McGuire planned and directed all aspects of victorious statewide Primary and General Election campaigns. He built a successful strategy identifying key issues, building grassroots and organizational support, and raising and budgeting funds. He recruited and supervised all staff, managed the candidate's schedule, and spoke for campaign on the record. He also analyzed public opinion data and electoral trends.

Alaska Department of Fish and Game

Role: Chief, Public Communications Section 07/84 – 03/86

Mr. McGuire was responsible for all facets of the public relations program for the Department, including projects and activities that were controversial, highly visible and subject to considerable public interest and scrutiny. He planned and directed the Department's public information and publicity programs including photographic, video, audiovisual, radio and written information. He acted as spokesperson for the Department on the most controversial and contentious issues. He also developed the struggling *Alaska Fish & Game* magazine into a profitable, award-winning publication and managed a staff of fourteen and an annual budget of $1 million.

Role: Special Assistant to the Commissioner 02/83 – 07/84

Mr. McGuire directed the Department's legislative relations program, including preparation of comments on legislation, testimony before Legislature, and coordination and approval of all communication with legislators. He promoted and won passage of key legislation, including new program that generated $2 million per year.

EDUCATION

B.A. (American Studies, with emphasis on Government and History, Economics minor) *Hamilton College*, Clinton, New York

Certificate, Senior Executives in State and Local Government, Kennedy School of Government, *Harvard University*, Cambridge, Massachusetts

Randal P. Cobena

Senior Vice President – Corporate Strategy

PROFILE

Mr. Cobena has over twenty years of management experience with the last fifteen years focused on project leadership of enterprise wide technology projects. Mr. Cobena has been very successful in implementing large, multi-jurisdiction, multi-platform projects in the public sector and looks forward to the opportunity to Saber's implementation of the Wyoming project in an on-time, on-budget, quality-assured and ethical manner.

AREAS OF EXPERTISE

- Twenty years senior management consulting experience in a wide variety of industries ranging from market-leading technology innovators to government/municipal organizations to money management solution providers
- Entrepreneurial drive has enabled consistently successful management of large-scale multi-disciplinary technology initiatives, drawing on management consulting skills developed through formative years with PriceWaterhouseCoopers
- Consulted for and managed many large systems technology initiatives in scale greater than $10 million and teams of more than fifty members and over 500 end users.
- Key experiences include developing/managing the full cycle of business relationships, conducting organization assessments around major technology efforts, developing systems deployment plans and strategies, directing project planning and management processes, and deploying process methodologies for risk management on deployment of new large-scale technology solutions.
- Key strengths include strong team leadership, organizing cross-functional resources, and exemplary communications skills.
- Past service delivery engagements have included:
    - Numerous Multi-jurisdictional Public Sector Projects, including Saber's HAVA Elections Practice
    - Strategic Financial System Deployment Plan Development
    - Impact Analysis, Risk Assessment and Quality Assurance
    - Administration of Technology Acquisition & Due Diligence Processes
    - Directing Business Process Review & Optimization Initiatives
    - Project Resources Planning and Project Life Cycle Methodology
    - Management of Business Requirements Analysis and Deliverables Development
    - Advisory Services for Internal Controls for Technology and Management

PROFESSIONAL EXPERIENCE

Project: Centralized Voter Registration Projects
Role: Executive and Oversight Manager 03/03 – Present

- In-depth involvement in managing the project schedule, monitoring key milestones, and ensuring that the resources and bandwidth are in place to ensure an on-time implementation of the projects
- Responsible for the development of the entire Testing Strategy including development of nine separate detailed test plans for different types of tests (unit tests, multi-module tests, integration tests, etc.)
- Major involvement in identifying automated test tools for the projects for load and performance testing as well as functional testing
- Developed and implemented County Hardware and Infrastructure Plans including overseeing the county hardware surveys to identify hardware and network needs of the counties
- Developed detailed understanding of the functional requirements of HAVA and Voter Registration and how those requirements are met through Saber's Electus application

Project: The City of Portland, Portland Development Commission
Role: Senior Management Consultant/ Practice Director 11/01 – 03/03

- Served as the senior management consultant for a large scale, enterprise-wide information systems effort. This included overall executive-level responsibility for development of a strategic system implementation plans, the publishing of business/technical requirements.
- Managed the consulting effort to develop a comprehensive specification of business requirements for enterprise software systems that supports the Commission's public policy goals. This included deriving business needs for the general ledger and loan processing systems, and defining integration with other financial systems for the City of Portland's public finance reporting systems.
- Served as lead architect for the creation of an enterprise portal and its associated content/databases management system (Oracle), as well as the portal publishing and reporting functions (MS-SharePoint and Documentum).
- Directed development of an improved, integrated technology architecture that serves as the underpinning to an enterprise-level technology strategy. The results have enabled the Commission to achieve its aggressive housing, urban revitalization and economic development goals through its various lending and financial assistance programs.

Project: State of Oregon (Information Resources Management Division)
Role: Senior Management Consultant/ Project Manager 12/98 – 11/01

Mr. Cobena successfully managed and served as the senior management consultant for strategy and technology on a large-scale, multi-year technology project that had statewide network communications services impact. His accomplishments included:

- Planned and directed executive-level strategic business planning exercises for the development of biennium business plans. Developed and presented to the State CIO and Executive Management Team a comprehensive business plan defining the goals, objectives and technology-based business processes that enabled the organization to move forward with new system plans.
- Conducted a broad-based State agency survey and services satisfaction assessment to identify where the service delivery and billing processes could be further optimized. Developed and presented a comprehensive management report to the CIO and Executive Management Team outlining concepts and recommendations for data base architecture and system changes designed to alleviate customer issues.
- Provided hands-on, working level reviews to the CIO on a large scale technology procurement contract for the development and implementation of new large-scale Oracle-based system designed to support the new business process definitions.
- Provided methodology-based project management direction and oversight for the implementation of the foundation platforms for the new Oracle-based technology solution. This included formulating presentation materials and conducting the actual presentation delivery of the key messages for advancing the project through analysis, design, development, and implementation.
- Provided overall project leadership for managing the Year 2000 portion of this project within the enterprise network services area for customer service delivery and billing processes, primarily within the telecommunications and data networking infrastructure areas.

Project: Frank Russell Company (Russell Equity Indexes)
Role: Senior Management Consultant 09/95 – 11/98

Under sponsorship of the Chief Financial Officer, Mr. Cobena served as a technology consulting advisor to the Company and directed all aspects of an enterprise-wide project for the implementation of new financial, human resources and business analytics management systems for this highly regarded global investment advisory and financial services firm. His key accomplishments included:

- Directed and managed major business process analysis exercises across a number of the Company's business lines for defining data access and reporting needs that increased the effectiveness of the accounting, operational support and financial management functions.
- Developed and presented to the senior executive team members and external audiences the key messages highlighting the business benefits realized from this investment emphasizing the value proposition associated with the deployment of the new technologies and the associated organization transformations.

Various Other Clients

Mutual of Enumclaw Insurance Company
Role: Management Consultant/Project Manager 1997 – 1998

- Consulted to the President, CIO and Operational Executives on their Year 2000 software conversion and related project planning issues.

- Developed materials for conducting awareness-building presentations to the Senior Management Team regarding significant risk factors with a pending project. These risks were large impact implementation issues relating to a planned mission-critical Oracle-based software migration project.

Betaseed, Inc.
Role: Management Consultant/Project Manager 1994 – 1998

- Planned and directed the deployment of new wide area and local area networks providing connectivity among several research facilities and the corporate office functions in the US and Germany.
- Redefining business practices and corporate procedures for workgroup communications (via Lotus Notes); the benefits of this project provided significant increases in productivity of the organization by reducing turn-around times for research and product development business initiatives. The successful accomplishments on this engagement were realized in part through the development and delivery of comprehensive training curriculum and knowledge transfer programs tailored specifically to the organization's business needs.

North Pacific Group
Role: Management Consultant/Project Manager 1994 – 1995

- This Portland, OR based company is one of Oregon's largest revenue, privately held corporations with revenues in excess of 1 billion dollars annually.
- Conducted an independent assessment of the legacy mainframe financial accounting applications, facilitated the replacement system selection RFP process and designed the project management process for implementing the new financial system as a Year 2000 migration strategy. Developed and conducted formal presentations of findings from the analysis effort to the CEO, CIO and members of the Management Team

Wieden & Kennedy Advertising
Role: Management Consultant/Project Manager 1994

- Wieden & Kennedy was retained by Microsoft to manage the Windows rollout advertising campaign. This campaign required the agency to complete a significant technology upgrade, migrating from a proprietary legacy network environment to Microsoft networking technologies. The project was completed successfully, on time and on budget under extreme time to market pressures.

Standard Insurance Company
Role: Management Consultant/Project Manager 1994

- Established the design of new technology development processes for critical business software for financially significant applications. This effort included the development and training format delivery of presentation materials and content for new methods and procedures relating to new client/server development methodologies.
- Conducted an organizational effectiveness study of the Corporate IT function and developed management recommendations providing key business process improvements to the organization.

- Directed the development of project planning methods, coordinated and directed numerous internal and external resources, and consulted with senior executive management on the allocation of large capital resources.

Coopers & Lybrand (Now PriceWaterehouseCoopers)

Role: Technology Auditor and Management Consultant 1991 – 1994

- Provided technology consulting services account management, conducted technology assessments, developed content materials for client presentations and conducted formal presentations to clients' senior management and independent oversight boards/directors/committees on significant technology issues and financial risk matters.
- Full service responsibility for projects in information systems consulting and in supporting financial system audit engagements.
- Major accomplishments in these consulting assignments included applying the Coopers & Lybrand SUMMIT structured methodology in a lead consultant capacity for the delivery of comprehensive IT solutions.

Schnitzer Steel,
Role: Operations Analyst and Project Manager 1989 – 1991

Kaiser Aluminum & Chemical Industries Inc.
Role: Manager of Financial Accounting 1985 – 1988

Mission Resources, Inc.
Role: Senior Accountant 1983 – 1985

Freeport-McMoran, Inc.
Role: Staff Accountant 1981 – 1982

EDUCATION

Masters Studies in International Business
Golden Gate University, San Francisco, CA

Masters Studies in International Business
University of New Orleans, New Orleans, LA

Bachelor of Science in Accounting and Finance
Louisiana State University, Baton Rouge, LA

Venkat Subramanian

Project Manager

PROFILE

Mr. Subramanian is Project Manager with five years of experience, with three years working on Statewide Voter Registration System projects. He is an accomplished Product Manager, and has a proven track record of ensuring on-time delivery of software applications.

AREAS OF EXPERTISE

- Proficient with Project Management, Produce Delivery Management, Business Process Analysis, Software Delivery and Implementation Management.
- Experience producing Functional Requirements Specification (FRS), Dynamic Systems Development Methodology (DSDM), Data Modeling, Data Migration, Object Oriented Programming, and Administering Windows and Wireless Networks

TECHNICAL SKILLS

Experience with SQL, Oracle, Oracle Discoverer, VB.NET, Java, VoiceXML, knowledge of Oracle Warehouse Builder, ETL tools, ASP.NET, AIDC (Automatic Identification and Data Capture) technologies

PROFESSIONAL EXPERIENCE

Saber

Role: Product Manager – Elections **02/06 – Present**

Mr. Subramanian was responsible for:

- Delivering on-time quality software
- Managing scope of work and expectations
- Prioritization of issues and issue resolution
- Managing application functional features, providing design solution
- Change management
- Client relationship
- Assisting project managers on transitioning projects from project mode to support mode
- Preparing proposals and change orders for 2nd phase of projects
- Producing project schedules, statement of work, list of deliverables
- Facilitating Joint Application Development (JAD) sessions

Project: Oregon Central Voter Registration System [OCVR]
Client: Department of Elections, Secretary of State, Oregon
Role: Project Manager 02/06 – Present

Mr. Subramanian was responsible for:

- Transitioning from project to support
- Preparing proposals and change orders for 2nd phase of projects
- Producing project plan, statement of work, list of deliverables
- Producing various frame work deliverables
- Presenting project status reports, steering committee reports
- Managing scope and expectation
- Prioritization of issues and issue resolution
- Application release management
- Change management
- Tracking project financials, resource utilization
- State and County relationship

Project: Iowa Central Voter Registration System [I-VOTERS]
Client: Department of Elections, Secretary of State, Iowa
Role: Application Development Manager 12/04 – 03/06

Mr. Subramanian was responsible for:

- Facilitating Joint Application Development (JAD) sessions with all the 99 counties of the State of Iowa for gathering and analyzing their business processes
- Developing Functional Requirements Specification (FRS)
- Performing GAP analysis to determine required customization
- Developing Entity Relationship Diagram (ERD)
- Designing software application and transferring functional knowledge to the software development team
- Scope management and prioritization of various requirements
- Developing data maps using Oracle Warehouse Builder for migrating data from various county level voter registration systems to CVR system
- Data extraction from various legacy systems
- Delivery of the software application with migrated data and process oriented module level training materials
- Planning and facilitating training events
- Roll-out of the application to all 99 Counties in Iowa
- Application release management and configuration management
- Working with client on various frame work deliverables

He was also actively involved with:

- Preparing responses for Request for Proposals (RFP)
- Project planning
- Preparing change orders
- Preparing Invoices
- Managing work hours and expenses of on-site project team

Project: Montana Central Voter Registration System [MT-VOTES]
Client: Department of Elections, Secretary of State, Montana
Role: Project Team 04/05 – 05/05

As part of this project team Mr. Subramanian was responsible for:

- Facilitating Joint Application Development (JAD) sessions with all the thirty-six counties of the State of Oregon for gathering and analyzing their business processes
- Developing Functional Requirements Specification (FRS)

Project: Missouri Central Voter Registration System [MCVR]
Client: Department of Elections, Secretary of State, Missouri
Role: Project Team 04/04 – 12/04

As part of this project team Mr. Subramanian was responsible for:

- Facilitating Joint Application Development (JAD) sessions with all the 116 counties of the State of Missouri for gathering and analyzing their business processes
- Developing Functional Requirements Specification (FRS)
- Performing GAP analysis to determine required customization
- Developing Entity Relationship Diagram (ERD)
- Designing software application and transferring functional knowledge to the software development team
- Developing data maps using Oracle Warehouse Builder for migrating data from various county level voter registration systems to CVR system
- Data extraction
- Working with client on various frame work deliverables

He was also actively involved with:

- Preparing responses for Request for Proposals (RFP)
- Project planning
- Designing and developing a module of the Central Voter Registration (CVR) system using VB.NET and Oracle 9i

Project: Oregon Central Voter Registration System [OCVR]
Client: Department of Elections, Secretary of State, Oregon
Role: Project Team **01/04 – 06/04**

As part of this project team Mr. Subramanian was responsible for:

- Facilitating Joint Application Development (JAD) sessions with all the 36 counties of the State of Oregon for gathering and analyzing their business processes
- Developing Functional Requirements Specification (FRS)
- Developing Entity Relationship Diagram (ERD)
- Designing software application and transferring functional knowledge to the software development team
- Developing data maps using Oracle Warehouse Builder for migrating data from various county level voter registration systems to CVR system
- Data extraction
- Working with client on various frame work deliverables

College of Forestry

Webmaster and IT technician **09/02 – 12/03**

- Designed, developed and maintained the website for Prof. Jeff McDonnell's Hillslope and Watershed Research group (www.cof.orst.edu/cof/fe/watershd)
- Created and published online lecture series by synchronizing lecture video with PowerPoint slides using MS Producer
- Developed a secure web application for online article submission and peer review process for Journal of Hydrological Processes using ASP application with VB scripts and SQL server on the backend.
- Designed and developed an Automatic Identification and Data Capture (AIDC) application that can automatically capture real-time data and communicate to a database server.

Megatech of Oregon

Project: Implementation of Lean Manufacturing System
Role: Business Analyst **05/02 – 09/02**

- Performed current state analysis of the information flow at the warehouse.
- Prepared Value Stream Maps [VSM] and Identified non-value added processes.
- Designed and developed a new Warehouse Management System (WMS) prototype using bar coded e-Kanban cards that captured data in real-time on inventory levels and transmitted to the existing ERP system using wireless bar code scanners; Automated the material requests made by the production floor; Monitored inventory levels and sent out automated e-mail notifications.
- Performed detailed cost analysis and Return of Investment [ROI].
- New WMS system increased production rate, reduced cost tied up with excess inventory and facilitated real-time data capture.

Oregon State University

Role: Systems Administrator, Industrial & Manufacturing Engineering

- Built and Administered Mobile Technology Solutions Laboratory (MTSL) that housed cutting-edge mobile AIDC devices
- Provided network support for more than 500 users of IME-OSU network
- Installed wireless network at the OSU college of Engineering

EDUCATION

Masters of Science in Industrial & Manufacturing Engineering, Oregon State University, Corvallis, OR

Bachelor of Science in Industrial Engineering, University of Madras, Chennai, India

Ali Mian

Data Migration Programmer

PROFILE

Mr. Mian has over five years of diversified experience in the IT Industry as a Software Developer, Data Modeler, Network Consultant, and Business Analyst. He has extensive experience in many aspects of software system design and implementation, focusing on Data Warehouse planning, design, and implementation. He has extensive experience with a wide variety of software tools on an assortment of hardware platforms in industries ranging from investment banking to election management.

AREAS OF EXPERTISE

- Extensive knowledge of SQL, PL/SQL functions, procedures and packages and experience in Oracle management (Oracle 8i/9i installation, performance tuning, debugging, applying fixes). Database design adhering to a well-defined software engineering process.
- Two Years of OWB (Oracle Warehouse Builder)/ETL, Data Mapping, Transformation and Loading in a complex, high-volume environment.
- Extensive programming skills in OWB ETL tool, PL/SQL, ORACLE and UNIX Shell.
- Expertise in Developing Transformations between Source and Target using Ab Initio.
- Expertise and well versed with various OWB components such as round robin, join, Rollup, partition by key, gather, merge, interleave, dedup sorted, scan, validate, FTP, etc.
- Well versed with various OWB parallelism techniques and implemented number of OWB Graphs using Data parallelism and Multi File System (MFS) techniques.
- Involved in providing production support to various OWB/ETL jobs and Oracle Database programs.
- Strong skills on OWB graph programming and Data Manipulation Language (DML).
- Worked with components in both GDE (Graphical Development Environment) and SDE (Script Development Environment).
- Worked on various graphs built in Co>Operating components of Database, Datasets, Departation, FTP, Sort, Transform, Partition and Validate.
- Strong background in Oracle RDBMS, Data Warehousing, Data Modeling.
- Expertise and Experience in OO programming using Java, SQL, HTML, JavaScript on Linux, UNIX, Windows.
- Experience in gathering requirements, preparing proof of concept, requirements analysis, design using UML and Rational Rose, good working knowledge of Multi-tier Client/Server Architecture.

- Thorough knowledge of unit, system and acceptance testing using JUnit, and Load Runner.
- Experienced using source control system such as CVS and ClearCase.

TECHNICAL SKILLS

Languages: C, C++, PL/SQL, ESQL, T-SQL, JAVA,HTML, DHTML, VBScript, XML, CGI, PERL, Shell scripts, Servlets 2.1, JSP1.0, EJB

ETL Tools: OWB (Oracle Warehouse Builder) 9i/10g, SSIS (SQL Server Integration Services)

GUI: Visual Basic 6.0/5.0/4.0, VB.Net

RDBMS: Oracle 10g /9i/8i, SQL Server, MS Access

Web Servers: Java Web Server 2.0, IIS4.0/5.0, Apache, Tomcat

Reporting Tools: Crystal Reports 8.x/7/6/5/4O, Oracle Reports 2.5

Oracle Tools: SQL Navigator, SQL Loader, Oracle Designer

Data Modeling Tools*:* ERWIN

Other Tools: CVS, AutoSys

Operating Systems: Windows 95, 98 & NT4.0, IBM AIX, SUN Solaris, MS-DOS

WORK EXPERIENCE

Saber Consulting Inc., Salem, Oregon
Project: Centralized Voter Registration System
Role: Data Migration Assistant Manager **02/05 – Present**

Elections Management and Centralized Voter Registration Practice has been developed from the ground up to assist states in implementing the Help America Vote Act (HAVA), especially Section 303 (Centralized Voter Registration) of the Act. Saber's solution encompasses a highly customizable HAVA compliant Elections Management and Centralized Voter Registration system, a world class fault-tolerant, scalable, and secure architecture, and a support program that provides dedicated onsite application and end-user (counties and towns) support.

Mr. Mian was involved in the successful Implementation of Statewide Voter Registration and Election Management Systems for the states of Oregon, Mississippi, Iowa, Missouri, Montana and Maryland.

Responsibilities:

- Working as the Assistant Manager\Lead developer and in charge for the data migration process for the States of Oregon, Mississippi, Iowa, Missouri, Montana, Maryland, Colorado and New York Designing the process of data migration, instructing the developers on implementing the design and managing the entire process flow.
- Worked as the lead developer and in charge for the migration of data for the State of Iowa, Designing the process of data migration, instructing the developers on implementing the design and managing the entire process flow.

- Interaction with client for information gathering and data verification process.

On the basis of analysis load the data received in flat files into Oracle staging schemas using OWB (Oracle Warehouse Builder) and SSIS (SQL Server Integration Services) implementing various mapping operators like file and external table operator and complex SQL Transformation.

- Document and design the simple and complex mapping for loading data from staging to target using OWB (Oracle Warehouse Builder) Operators and SQL, PLSQL and T-SQL transformations.
- Used various operators like Joiner, Splitter, Filter, Pivot, Un-Pivot, Set Operator, Deduplicator, Constant Operator, aggregator, Lookup.
- Generated reports and designed Business Intelligence for clients using Oracle Discoverer.
- Document and create internal QA packages through complex SQL and PLSQL Procedures and Functions.
- Interact with QA and the Application development team to ensure business rules and improving the output of the process constantly.
- Responsible for maintenance Sandbox and OWB (Oracle Warehouse Builder) repositories.
- Managing and assisting the DM team when they need assistance with the process of Data Migration or maintaining the database.

Environment: HP, Windows NT, Oracle 10G, OWB (Oracle Warehouse Builder) 10G, SSIS (SQL Server Integration Services), Microsoft Visual Studio.net, SQL, PL/SQL, T-SQL.

Kingland Systems Inc, Ames, IA
Data Research Analyst **10/04 – 1204**

Mr. Mian worked in a team environment to research on mutual funds and equities to develop a database containing useful information for investors.

Responsibilities:

- Designed the specifications for the new cases (new applications).
- Involved in extensive usage of Erwin 4.0 for Data Modeling for both logical and physical design of the database including creation of E-R diagrams, Functional Hierarchy diagrams, Process diagrams and Data Flow diagrams.
- Created integrity constraints for data validations.
- Debugged all the packages to make them bug-free.
- Defined menus and attached them to user-defined forms.
- Analyzing, Researching and saving information on stocks as useful data into the database using Insight which was directly connected to the database.
- Maintaining database with updated data.

Environment: Oracle 9i, SQL, Pro*C, C, C++, Win NT, UNIX, Erwin 3.5.2, MS Office, Windows NT/2000

Iowa State University, Ames, IA
Network Consultant **08/01 – 12/03**

Responsibilities:

- Diagnosed and correct computing problems for students and faculty
- Install hardware and software
- Rebuild lab computers using Ghost
- Notify the lab manager of any hardware problems and possibly assist in making any necessary repairs.
- Troubleshoot network related hardware and software issues from building a network physically to installing software.
- Installing equipment including hubs, scanners and printers.

Environment: Win NT, MS Office and Ghost.

EDUCATION

Bachelors in Computer Science, Iowa State University, Ames, IA

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Venkat Nagarajan

Functional Analyst

PROFILE

Mr. Nagarajan has about two years experience in functional analysis and project management experience in working on the statewide voter registration system. He is an accomplished Business analyst and has experience in the SDLCs of a project, including market research, user requirement analysis, functional analysis, and testing. He has experience generating Reports, and Graphs using Oracle Reports and Crystal Reports.

TECHNICAL SKILLS

Modeling Languages: Use Cases diagramming, UML, MS Visio

Packages: MS-Visio, Minitab

Database: Oracle8i, SQL-Server, MS-Access, MS-Excel

Reporting Tools: Oracle Forms & Reports, Crystal Reports 8.0, PS/Query, Oracle Designer, TOAD

Operating Systems: Windows 2000/NT/XP, UNIX, LINUX, MAC

Languages: C, C++, Visual Basic 6.0, HTML

ERP: PeopleSoft (Modules - Financials, Student Administration), SAP R/3

PROFESSIONAL EXPERIENCE

Saber Consulting, Inc. Salem, OR
Project: Missouri Central Voter Registration System [MCVR]
Client: Department of Elections, Secretary of State, Missouri
Role: Deputy Project Manager and Functional analyst
Dates: 06/2005 to 02/2007

- Functional Analysis and point of contact with the client for Missouri Centralized Voter Registration (MCVR project)
- Scope Management and issue level prioritization of requirements
- Delivery of the software application and process oriented training material
- Application release management and configuration management
- SDLC Workflow system administration for Saber projects in different verticals - Voter Registration, Retirement and Department of Motor Vehicles(DMV)
- Application release management and configuration management
- Deliverables tracking and preparing invoices
- Tier 2 level (analysis) support for Maryland Centralized Voter Registration project

Enterprise Systems, University of Houston, Houston, Texas
Project: Peoplesoft Student Administration
Role: Application Developer
Dates: 06/2003 to 05/2005

- Designed and implemented a PeopleSoft based tracking and Reporting Application using PeopleSoft tools (Application Designer, Application Engine, PL/SQL)
- SQR reporting for Meta dictionary migration from legacy systems- ADMIN to Oracle11i
- SQL/Query development on PS-Query for Student Administration Module
- Macros (MS-Excel) for server load testing for the new PeopleSoft 8- Student Admin
- Change management analysis and investigation a new patch management solution
- Version control and change management for PeopleSoft 8 Objects
- Performance testing and tuning of PeopleSoft environment for 40,000 users using OPENSTA
- Performed analysis for writing business requirements and technical design documents for the UH-System PeopleSoft 8 architecture
- Analyzed the business requirements and drafted the architectural design using MS Visio
- Recommended a new solution for effective change management after evaluation of various change management solutions including a potential solution – ECORA

Riviana Foods, Houston, TX
Project: Integrated Marketing Communications Plan
Role: Market Research analyst
Dates: 08/2004 to 12/2004

- *Integrated Marketing Communications plan:* Assisted the flavored Rice making company with a strategic analysis of their repositioning and brand marketing in the food market
- Analysis included a detailed assessment, surveying and analysis of the various target market in the Southwest coast region based on the ethnicity and age group
- Prepared a user requirement manual to identify the user categories and needs
- Focus areas included analysis and synthesis of the market segments, new application areas, competitor products, and product demand
- Analysis included a detailed assessment and analysis of the various competitors in the west coast region of the United States
- Developed an integrated marketing communications plan which stretched across strategies for successful brand marketing, identifying partners for strategic alliances
- Designed a baseline communication model and a plan for crisis communications

- Developed a Marketing Planning document with focus on target markets and marketing strategies based on the targeted income groups and product segment classification
- Performed the feasibility analysis of marketing plan in the project

AIM Investments, Houston, TX
Project: Integrated Marketing Communications Plan
Role: system Analyst (To-Be-System)
Dates: 01/2003 to 05/2003

- Tools: SDLC concepts, Use Case Diagrams, MS Visio, MS Word
- Developed a business process system to map the entities of the investment organization as seen from a managerial perspective.
- Performed analysis for writing business requirements and functional design documents for the following projects: data conversions from the manual systems to an automated system
- Designed the '*To-Be-System*' in the SDLC of the project using the web capabilities of *Oracle11i* with a focus on (a) information system design and (b) interfacing issues
- Re-Designed the process flow and workflow using UML and MS Visio
- Designed a business strategy to involve the transition of business operations from the old to the re-engineered processes (To-Be-System)
- Analyzed Business and Technical specifications, developing Use-Cases, test requirements and procedures and formulate a robust business model (UML, MS Visio).
- Developed an '*automatic vendor payment system* 'using a secure dynamic website that could be updated from Oracle11i Financials

JournalServer.org (non-profit)
Project: BSO classification for Cataloging
Role: Research and Development
Dates: 01/2001 to 01/2002

- Designed the automation of the Broad System of Ordering (BSO) - a robust classification system for cataloging purposes (http://www.classbso.demon.co.uk/wwwpgaa.htm) for the ongoing high quality freeware digital library project (http://www.journalserver.org) that would be used by the developing countries in the world for online scientific journal publishing purposes
- The beta version of the product is currently being tested in various countries including USA, UK, India and Sri Lanka (as of 2007)

Technical Support Services (TSS), University of Houston, Houston, TX
Project: Organizational Structure Analysis
Role: IT Analyst
Dates: 01/2001 to 05/2001

- Tools: MS Visio, UML, MS Word

- Analyzed the organizational structure and operational design of 'Technical Support Services'
- Developed a report to map the organizational structure of the IT division (using MS Visio)
- Prepared Business Process Models to show the operational design from the Conceptual level
- Developed a Functional and operational level documentation for the SBUs of the TSS

Madras Fertilizers Limited, Chennai, India
Project: Automation of Effluent Treatment System
Role: Instrumentation Engineer
Dates: 01/2000 to 05/2000

- Tools: Visual Basic 6.0, MS Word
- *Distributed Control System (DCS):* Used the principles of Distributed Control Systems (DCS) to automate the effluent treatment process with real time monitoring of the process parameters
- The simulated software was estimated to minimize the man power used and time consumed in the plant and increased the efficiency of the treatment process by 30%

EDUCATION

Masters in Business Administration
University of Houston (main campus), Houston, Texas

Masters in Electrical Engineering (Telecom)
University of Houston (main campus), Houston, Texas

Bachelor of Engineering in Instrumentation & Control
St. Joseph's College of Engineering, University of Madras, Chennai, India

Mark K. Butler

Implementation & Training Manager

PROFILE

Mr. Butler is an implementation and training manager with over four years of experience in training, documentation, and coordination of various project related activities. He has extensive knowledge in development of training material for the end users, and is an excellent coordinator for facilitating various software related implementation activities. He has successfully coordinated with clients for product rollouts, training activities, and trained helpdesk personnel resulting in fully satisfied customers.

AREAS OF EXPERTISE

- Experience with troubleshooting client hardware and client network
- Extensive working knowledge on district boundary mapping and transforming mapping information in to splits and address ranges
- Experience with analysis and business process workflow development
- High degree of collaborative ability, and interpersonal skills
- Exceptional written and verbal communication skills
- Statistical modeling and applications
- Expertise with PC-based Spreadsheets, databases and presentation software
- Integrated Marketing Communications planning
- Media buying and marketing tools evaluation
- Market position assessment

PROFESSIONAL EXPERIENCE

Saber Consulting, Inc. Salem, OR
Project: Oregon Centralized Voter Registration (OCVR)
Client: Department of Elections, Secretary of State, Mississippi
Role: Tier II Support Manager
Dates: 2006 to 02/2007

As part of the project team, Mr. Butler's responsibilities included

- Managing customer issues, managing scope and issue level priority, and issue escalation per procedures established for the purpose
- Coordination of invoicing for the client
- Testing, issue resolution and customer support
- Facilitating timely ongoing training for clients

- Coordination between the Client team and the Saber Team to facilitate translation of business requirements to application changes
- Coordination between counties and the Saber team for software implementation and other hardware related issues
- Providing application expertise/train the Help Desk personnel to resolve issues that cannot be resolved at the level one support

Saber Consulting, Inc. Salem, OR
Project: Oregon Centralized Voter Registration (OCVR)
Client: Department of Elections, Secretary of State, Oregon
Role: Technical Training Coordinator
Dates: 2005 to 02/2007

As part of the project team, Mr. Butler's responsibilities included

- Managing customer issues, managing scope and issue level priority, and issue escalation per procedures established for the purpose
- Testing, issue resolution and customer support
- Facilitating timely ongoing training for clients
- Coordination between the Client team and the Saber Team to facilitate translation of business requirements to application changes
- Coordination between counties and the Saber team for software implementation and other hardware related issues
- Providing application expertise/train the Help Desk personnel to resolve issues that cannot be resolved at the level one support

Saber Consulting, Inc. Salem, OR
Project: Montana VOTES (MTVOTES)
Client: Department of Elections, Secretary of State, Montana
Role: Technical Training Coordinator
Dates: 2005 to 02/2007

As part of the project team, Mr. Butler's responsibilities included

- Developing the training material and train the Montana counties on the MTVOTES voter registration system
- Providing application expertise/train the Help Desk personnel to resolve issues that cannot be resolved at the level one support
- Coordination of the development and implementation of a county data verification checklist used to confirm the county's data pre and post migration.
- Conducting training sessions and onsite post data migration sessions.
- Working with a co-instructor in training all of MTVOTES material
- Providing insight for counties in integrating existing business processes into MTVOTES.
- Coordination between the counties and the Saber team for various implementation related activities

Saber Consulting, Inc. Salem, OR
Project: VoteHere Mail-in Ballot Tracker Program
Client: Department of Elections, Secretary of State, Washington
Role: Elections Training Consultant
Dates: 2005 to 02/2007

As part of the project team, Mr. Butler's responsibilities included

- Successfully trained Washington state counties for '***VoteHere Mail-in Ballot Tracker'*** project
- Training and Documentation for clients
- Trained potential future trainers
- Managed issue level scope and defined the protocol for emergency escalation

United Way Mid-Willamette Valley
Role: Loaned Executive
Dates: 2004 to 2005

- Coordinated the efforts of over thirty organizations to reach their fund raising targets
- Optimized the effectiveness of various fund raising programs by improving existing strategies, creating unique marketing tools, launching new campaigns and evaluating intermediary and final outcomes
- Tracked overall effectiveness of these campaigns both qualitatively and quantitatively

Salem Chamber of Commerce
Role: Marketing Consultant
Dates: 2004

- Refined and improved "Buy in Salem" program by defining target market, conducting feasibility studies, assessing the existing campaign, and developing tools to evaluate program performance
- Developed strategies for future program modification and expansion using trend studies and statistical modeling.

SpaceKraft Global Packaging Co.
Role: Marketing & Strategic Planning
Dates: 2002 to 2003

- Identified opportunities for product and market expansion
- Acted as liaison between clients and project team to ensure that corporate strategies were responsive to customer demands.

Salem Boys and Girls Club.
Role: Strategic Planning
Dates: 2002 to 2003

- Participated in the strategic, creative planning process, and launched a successful marketing campaign with expenses well below budget
- Produced various marketing vehicles; billboards, mailers, bus pieces, and periodicals
- Delivered periodic written and oral reports and recommendations to the Board of Directors.

Habitat for Humanity
Role: Strategic Planning
Dates: 2002 to 2003

- Led a team of eight MBA students in the preparation of a business plan for the development of Habitat's 'Auto Donation' program.

Salem Keizer Volunteer Association
Dates: 2002 to 2003

- Constructed an Access database to promote more efficient resource allocation and organization.

Baileigh Industrial Inc.
Role: Market Development Manager
Dates: 1999 to 2001

- Created and executed a "blind" study to determine the company's competitive position in the market
- Facilitated product penetration into Canadian and Mexican markets
- Assessed and developed strategies for further expansion opportunities. Composed creative content for industry publications, flyers and mailers
- Worked closely with engineers and clients to facilitate marketing goals and strategies.

CableCom
Role: Site Manager/Technician
Dates: 1994 to 1998

- Supervised two to eight person project teams. Responsible for: work scheduling, planning and implementation, multiple team management and coordination, conflict resolution within workforce and with clients
- Collaborated and negotiation with contractors, resource allocation and task delegation to ensure overall efficiency and work quality.

Army National Guard
Role: Recruiter
Dates: 1993 to 1994

- Doubled the recruitment in low yield areas in six months by conducting active and aggressive recruiting
- Developed promotional programs and provided education to candidates and community
- Awarded the Army Achievement medal for efforts within the first year.

Chope Community Hospital
Role: Volunteer
Dates: 1992

- Assisted with day-to-day operations in the emergency room, and in the three psychiatric wings. Trained new volunteer personnel.

EDUCATION

Masters in Business Administration and Public Management, Willamette University, Salem, OR

Bachelor of Science in Political Science, Willamette University, Salem, OR

MILITARY EXPERIENCE AND HONORS

1985-1987 Third US Infantry (TOG), Arlington, VA

- Army Commendation Medal
- Army Achievement Medal (X2)
- Air Assault Badge
- Good Conduct Medal
- Commandant's List Primary Leadership Development Course

Srinivas Ramachandran

Infrastructure and Data Center Manager

PROFILE

Mr. Ramachandran has fifteen years experience in information systems, system architecture design and deployment, Oracle database administration, network design, network security, data warehousing implementations, providing high quality and cost effective database and network technology solutions. He is an Oracle Certified Database Administrator and an Oracle 11i e-Business/Collaboration Suite Database Specialist. Mr. Ramachandran has additional expertise in several operating systems including UNIX (Sun Solaris, HP, UNIX, and IBM AIX), Linux, and the Windows Operating Systems (Windows 2000/2003 server). He has been responsible for designing and implementing the centralized voting registration systems for states of Oregon, Mississippi, Iowa, Maryland, Missouri and Colorado.

AREAS OF EXPERTISE

- Expertise in Oracle Apps: 11i DBA / Oracle DBA, 11i installations, and Oracle Applications 11i upgrades. Experience with Release 10.7 SC, Release 11.x, and Release 11i. Worked on one terra byte sized databases.
- Oracle 9i, 10g RAC, Advanced Replication, Designer.
- DataGuard/Hot Standby Database.
- Oracle experience: 11i e-Business Suite, Oracle9iAS Portal, Discoverer, Designer, Oracle Warehouse Builder.
- Implementations include: 11.0.3, 11.5.3, 11.5.5, 11.5.7, and 11.5.9 on Sun Solaris, HP-UX, IBM AIX, Linux and Windows.
- Database migrations: from 7.3.4 and 8.06 to 8.1.7.4, 9i and 10g.
- Migration of: Oracle Applications from IBM AIX to Linux.
- Database and applications cloning: Adclone, Autoconfig and Rapid Clone Utilities, UNIX SNAP CLONE, SNAPSHOT (EVA).
- Patches: Applied Maintenance, Family Pack, Mini Pack, and one-off Patches to Oracle Applications, conversant with AD Utilities.
- Patch history: patch set history information in different formats and layouts obtained from web sites.
- Storage: HP EVA / MSA, EMC and RAM SAN technologies.
- RAID systems: implementation and configuration.
- Troubleshooting: RDBMS issues, connectivity issues, concurrent manager issues, reports, and printers.

- Modules implemented: Financials (GL, AR, AP, FA, and CM), Manufacturing (WIP, BOM, MS/MRP, CRP, APS), Distribution (INV, OE, ONT, and PO), CRM (iStore, Oracle Quote, ASO, CZ), HRMS (HR, Payroll, and BEN), Oracle Self Service I-Components, ADI, ADE, Oracle Configurator Developer, Oracle Workflow, Mobile Application Servers, and Oracle Process Manufacturing (OPM).
- Performance tuning: performance tuning to meet large system demands and heavy transaction volumes.
- Performance tuning tools: 10g Grid, 10g Wait Events, STATSPACK, OEM, TOAD, SPOTLIGHT, Shell Scripts to monitor and manage application databases and infrastructures to isolate the root cause of bottlenecks. Customized UNIX and SQL scripts to capture performance metrics.
- Disaster Recovery: comprehensive disaster recovery plan ensuring high database availability. Configured and maintained Oracle DataGuard and Hot Standby databases.
- Load balancing: Global load balancing of datacenters located geographically different locations using F5 Global Traffic Controllers formerly known as 3DNS. Citrix Web and Access Gateway appliances using F5 BIG-IP Local Traffic Manager's. Oracle Applications Forms and Web Load Balancing to distribute the load on Application Servers using both Metrics and CISCO CSM.
- PCP or DCP: Parallel Concurrent Processing on middle tiers.
- Migration: Migrated Oracle Applications 11.5.8 from IBM AIX to Linux.
- Install, configure, and maintain Citrix Web, Citrix Secure Gateway, and Citrix MetaFrame Server 3.0 / 4.0, Citrix Access Gateway.
- Implement switches, routers, firewalls, Network Console Switches and other network appliances.
- Perform security assessments, implement secure network infrastructures, technology architecture reviews, and determine viability, install configure McAfee Autoupdate Architect.
- Implement F5 Networks 3DNS and BIG-IPs.
- Implement TopLayer's Intrusion Prevention Systems (IPS) and Proventia's Intrusion Detection System (IDS).
- Configure storage systems: EVA, MSA and EMC storage.

TECHNICAL SKILLS

Hardware: IBM pSeries 690, IBM RS/ 6000, HP Blades BL20P, HP ProLiant Servers, Sun Servers Enterprise E450, E250, Sun fire V880, Sun fire 3800 and V280R), HPUX LCLASS, KCLASS, ACLASS, Linux HP Blades, and Xeon Processor Dell PowerEdge Series Servers.

Operating Systems: Sun Solaris 8, 7, 2.6, 2.5.1, HP-UX 11.00, IBM AIX 5.X, Windows NT / 2000/2003 Servers, Redhat Linux 2.x/3.x/4.x.

Application Servers: Microsoft IIS, Apache, Oracle Application Server and WebLogic Servers.

Databases: Oracle Database 10g (10.1.x and 10.2.x), 9i (9.2.X, 9.0.1), 8i (8.1.6, 8.1.7.x) and 8.0.x, 7.3.x, Oracle 9i / 10g Real Application Clusters (RAC) on both Windows 32/64 bit and Linux 32 / 64 bit , Oracle DateGuard, Oracle Advance Replication, Streams, Designer and Oracle Warehouse Builder

Business Intelligence Tools: Discoverer, Business Objects.

Microsoft Technologies: MS SQL Server 2005, BizTalk Servers, IIS

Programming Languages: Shell Scripts, PL/SQL, MOD_PL/SQL SQL, Perl, PHP, HTML, DHTML, JSP, SERVLETS, JAVA and EJB

ERP: Oracle E Business Suite R11i (11.5.x), 11.0.x, 10.7 SC and BAAN ERP.

Networking: F5 Networks 3DNS and BIG-IP, TopLayer's IPS, Proventia's IDS, Cisco and HP switches and routers, Netscreen, Cisco and Fortinet firewalls, and other network appliances.

Citrix Products: Citrix Web, Citrix Secure Gateway, Access Gateway and Citrix MetaFrame Server.

Storage Systems: EVA, MSA and EMC Storage.

PROFESSIONAL EXPERIENCE

Saber

Project: Centralized Voter Registration Systems (CVR)
Role: National IT Director **01/07 – Present**

Leading the entire Customer Infrastructure Support group with responsibility over Electus, CCMS, UI, and Retirement.

- Work with Project Managers and LOB portfolios to understand project requirements.
- Coordinating with the Infrastructure Managers to meet the necessary project goals, and work with ITM's in implementing best practices.
- Track project deadlines and goals.
- Assemble the required resources for each new and existing project.
- Prepare technical proposals for new projects.

Project: Centralized Voter Registration Systems (CVR)
Role: Technical Services Manager **01/04 – 01/07**

The CVR project will create a single voter registration and election management system that will be used by the counties and the secretary of state's office, which oversees elections. The system also consolidates the voter registration lists currently stored separately by counties into one single centralized database.

Responsibilities:

- Perform system architecture design, deployment, and testing
- Manage the datacenters for the Centralized Voting Registration system for states of Oregon, Mississippi, Iowa, Maryland, Missouri and Colorado
- Lead a team of fifteen Database and Network Engineers
- Play an important role as the backup and recovery plan lead for all datacenters
- Play an important role as a Disaster recovery planning lead
- Coordinate and monitor database upgrades and regular tuning
- Install and upgrade Citrix
- Work closely with the network engineers to set various security policies on the various firewalls and intrusion prevention systems
- Work with the network team in effectively designing the global and local load balancing for each of the datacenters
- Perform security assessments, implement secure network infrastructures, technology architecture reviews, and determine viability

Project: 24 Hour Fitness Membership Management Project (M2)
Role: Sr. Oracle Applications DB Administrator 06/03 – 12/03

Environment: Oracle Applications 11.5.8, Oracle 9i, IBM AIX 5.2 64 bit, Linux 2.1 AS, Windows 2000/XP,Quest Central ,TOAD, Spotlight, OEM, Remedy, and QVCS.

APPS Modules Implemented: Oracle Applications 11.5.8 (Financials: AR, AP, GL; CRM: Core Contracts, Service Contracts, Sales Compensation, and Service).

Description: 24 Hour Fitness is the world's largest privately owned and operated fitness center chain with more than 2.7 million members and over 300 clubs located in 16 U.S. states and in Europe and Asia. The 24 Hour Fitness database is nearly one terabyte in size. This project implemented an eBusiness solution for the client using Oracle Applications 11i.

Responsibilities:

- Installed and configured Oracle Applications 11.5.8
- Cloned database and Oracle Applications using Rapid Clone utility
- Performed database sizing
- Migrated Application Tiers from AIX to Linux
- Set up Cisco (CSM) Forms and web server load balancing
- Configured parallel concurrent processing on middle tiers
- Configured Oracle applications 11i to send email from within Oracle applications
- Performed code migrations using FNDLOAD utility
- Managed DBA activities included setting up Oracle user accounts and passwords, database and instance creation, database space management, table distributions; redo logs, archived redo logs and rollback segments on different disks for data retrieval optimization
- Exported and import of statistics for optimizing SQL queries

- Created rollback and redo logs for optimal performance by eliminating the contention
- Relocated and shuffled redo logs and data files
- Supported Legacy System 8i / 9i databases
- Performed Oracle Applications system administration
- Installed and used StatsPack utility to collect database statistics and extended server statistics by creating new tables to collect operating system level statistics
- Created and registered custom applications with Oracle Applications 11i
- Wrote shell scripts for task automation, performance monitoring, and instance tuning
- Performed troubleshooting for pre production and post production issues
- Provided 24x7 post production support
- Extensively used of Quest Central, Spot Light, and TOAD
- Configured OMS and OEM for scheduling jobs, events, and monitoring of various services and space management issues to send email and pager alerts to DBA team

Project: Republic Enterprise Systems
Role: Senior Oracle Applications DBA 03/02 – 05/03

Environment: Oracle Applications 11.5.8, Oracle 9i, Sun Solaris 8, Windows 2000/XP, ORACLE 9iAS, Oracle Portal, TOAD, SQL Plus.

APPS Modules Implemented: Financials (GL, AR, AP, FA, CM), Manufacturing (WIP, BOM, MS/MRP, CRP), Distribution (INV, OE, ONT, PO), CRM (iStore, Oracle HTML Quoting, etc), HRMS (HR, Payroll, BEN), Oracle Self Service I-Components, ADI, ADE, Oracle Configurator, Oracle Workflow, Mobile Application Servers.

Description: Republic Windows and Doors is a manufacturer of custom vinyl windows and doors for new homebuilders, home improvement dealers, and direct commercial accounts throughout the United States. To increase sales and reduce lead times, Republic replaced their People Soft ERP and legacy systems with Oracle Applications 11i.

Responsibilities:

- Installed and configured Oracle Applications 11.5.5/ 11.5.7, later patched up to 11.5.8 by applying 11.5.8 maintenance pack, and installed and configured the Oracle Portal
- Patched the instance up to 11.5.6 by applying 11.5.6 ERP and CRM Family Pack
- Implemented CRM iStore, Oracle Quoting, and Order Capture
- Cloned database and Oracle Applications using adclone / adconfig utilities
- Installed and configured ADI, ADE and Oracle Configurator Developer
- Performed database sizing
- Performed instance tuning, database tuning, and OS tuning
- Configured RAID 0 +1 software
- Configured Mobile Applications Server

- Managed DBA activities including setting up Oracle user accounts and passwords, database and instance creation, database space management, table distribution, redo logs, redo log archiving and rollback segments on different disks for data retrieval optimization, and Oracle applications system administration
- Installed and applied of StatsPack utility for database statistics collection
- Installed and configured the 9iAS Portal
- Performed RMAN implementation for Oracle 11i database
- Created and registered custom applications with Oracle Applications 11i, Oracle Portal, and Discoverer
- Supported 24 x 6 production systems
- Created patch scripts and posted patch set to web site for distribution
- Configured OMS and OEM for scheduling jobs, events, and monitoring of various services and space management issues to send email and pager alerts to DBA team
- Wrote shell scripts for automating tasks, and performance monitoring and tuning of instances

RCC, Inc. Edison, New Jersey

Project: Various NJIT Projects
Role: Sr. Oracle Applications DB Administrator 03/01 – 02/02

Environment: Oracle Applications 11.5.4, Oracle 8i, Sun Solaris 8, HP UNIX 11, Windows 2000/NT, TOAD, SQL Plus, Web Logic, Java.

APPS Modules Implemented: Financials (GL, AR, AP, FA, CM), Distribution (INV, OE, ONT, PO), HRMS (HR, Payroll, BEN).

Description: New Jersey Institute of Technology (NJIT) is New Jersey's public technological research university. NJIT is one of the most computing-intensive universities in the United States with more than $50 million in research support through 20 state-of-the-art multidisciplinary centers. NJIT executes turnkey projects for the New Jersey Department of State.

Responsibilities:

- Installed Oracle Applications 11.5.4
- Cloned database and Oracle Applications
- Supported J2EE application, using Web Logic Server, and Oracle 8i as backend
- Applied required patches to applications as needed
- Managed DBA activities included setting up Oracle user accounts and passwords, database and instance creation, database space management, table distribution, creating redo logs, archiving redo logs and rollback segments on different disks for data retrieval optimization, application performance tuning and monitoring, setting database and UNIX kernel parameters, patch and upgrade installations, and producing documentation
- Performed RAID configurations
- Sized table spaces, data files, tables, and extents

- Performed Oracle Database and Application tuning
- Provided Oracle Applications system administration included creation of new concurrent managers, new forms, reports registration, creating new responsibilities, menu structure, and report security groups
- Migrated Oracle Database from 8.0.5 to 8.1.6
- Performed SQL*NET configuration and user workstation configurations for client connectivity
- Created shell scripts for automatic startup and shutdown of databases as well as automated backups
- Installed Oracle9iAS, and Oracle9i Application Server

Project: Milk Production and Inventory Systems
Role: Oracle App DB Administrator, Developer 08/00 – 02/01

Environment: Oracle Applications 11.5.2, Oracle 8i, HP UNIX 11, Windows 2000/NT, SQL Navigator, SQL Plus.

APPS Modules Implemented: Financials (GL, AR, AP, FA, CM), Manufacturing (WIP, BOM, MS/MRP) Distribution (INV, OE, ONT, PO), HRMS (HR, Payroll, BEN), Oracle Self Service applications.

Description: Foremost Farms, known for their Land of Lakes brand, is a dairy cooperative owned by about 3,700 dairy farmer-members in Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin. In 2002, they had over $1 billion in sales, supplying over five billion pounds of milk, and were among the top ten dairy cooperatives in the United States in terms of milk volume. Implemented Oracle Process Manufacturing (OPM) which is a solution optimized for the process manufacturing industry.

Responsibilities:

- Installed of Oracle Applications 11.5.2
- Managed DBA activities included setting up of Oracle user accounts and passwords, database and instance creation, database space management, table distribution, redo logs, redo log archiving and rollback segments on different disks for data retrieval optimization, application performance tuning and monitoring, setting database and UNIX kernel parameters, patch and upgrade installation, and producing documentation
- Created database, table spaces, schemas, database tuning, SQL Loader, backup of data and relevant files, backup and recovery, and query optimization
- Cloned database and Oracle applications
- Performed SQL*NET configuration and user workstation configurations for client connectivity
- Created shell scripts for automatic database startup, shutdown, and backup
- Provided Oracle Applications system administration included creation of new concurrent managers, new forms, reports registration, created new responsibilities, menu structure, and report security groups
- Developed and customized of applications using Oracle Developer Reports and Forms

- Wrote PL/SQL procedures for business process automation
- Generated script for monitoring database usage and performance
- Monitored rollback and temporary segments, optimized disk I/O, optimized the SGA, tuned SQL statements, and ran UTLBSTAT and UTLESTAT scripts to monitor and tune database performance
- Managed Oracle database export and import
- Contributed to Gemms to OPM upgrade process and responsible for OPM Manufacturing Modules

Client: MRF Ltd., Chennai, India
Role: Oracle Applications DB Administrator 01/00 – 07/00

MRF is India's leading tire manufacturer and distributor with six manufacturing facilities and a worldwide distribution to seventy-five countries. MRF is a diversified company with a major toy division, Funskool, which manufactures board games, action figures, and other popular toys. Funskool is a joint venture between MRF and Hasbro, Inc., the world's largest toy company.

Environment: Oracle Applications 11.0.3, Oracle 8i, Sun Solaris 7, Windows 2000/NT, SQL Navigator, SQL Plus, Developer 2000.

APPS Modules Implemented: Financials (GL, AR, AP, FA, CM), Oracle Process Manufacturing (WIP, BOM, MS/MRP) OPM Distribution (INV, OE, ONT, PO), HRMS (HR, Payroll, BEN), Oracle Self Service applications.

Responsibilities:

- Installed, configured, and administered Oracle Process Manufacturing Applications version 11.0.3
- Performed daily maintenance activities on a production database which included data refresh
- Created new responsibilities, menus, concurrent programs, and report groups
- Performed regular backups and tuning of Oracle database, and PL/SQL tuning
- Monitored rollback and temporary segments, optimized disk I/O, optimized the SGA, tuned SQL statements, ran UTLBSTAT and UTLESTAT scripts to monitor and tune database performance
- Created database, table spaces, schemas, performed database tuning, SQLloading, backup of data and relevant files, backup and recovery, query optimization, and established client server connectivity
- Cloned database and Oracle applications
- Contributed to Business Flow Study
- Created scripts for new tables, private synonyms, public synonyms, views, and database triggers depending on need
- Performed Oracle Manufacturing Modules
- Produced Aims documentation

Client: Solix Systems Pvt. Ltd., Hyderabad, India
Project: Oracle Applications DB Administrator 02/98 – 12/99

Solix Systems in Hyderabad provides remote support as the Solix offshore development center and also provides remote client support.

Environment: Oracle Applications 11.0.3 / Oracle Applications 10.7 SC, Oracle 7.32 / 8.0.5, Sun SPARC Solaris 2.5 / 2.6, Developer 2000, SQL*Plus, Windows 95/NT

Responsibilities:

- Installed, configured, and administered Oracle Process Manufacturing Applications version 11.0.3
- Installed, configured, and administered Oracle Applications version 11.0.3.
- Performed application development and customization
- Monitored rollback and temporary segments, optimized disk I/O, optimized the SGA, tuned SQL statements, and ran UTLBSTAT and UTLESTAT scripts to monitor and tune database performance
- Created database, table spaces, schemas, performed database tuning, SQLoading, backup of data and relevant files, backup and recovery, query optimization, and established client server connectivity
- Cloned database and Oracle Applications
- Acted as a member of the Resource Team for offshore projects
- Performed daily maintenance activities on a test database
- Created New Responsibilities, Menus, Concurrent Programs, and Report Groups
- Performed regular Oracle database backups and tuning, and PL/SQL tuning
- Developed Oracle Manufacturing modules

Client: Crompton Greaves Ltd., Hyderabad, India
Project: Oracle DB Administrator 06/94 – 01/98

Crompton Greaves is a large Indian manufacturer of electrical and electronic equipment. This project involved developing a business management tool to track their electrical project activities.

Environment: Oracle 7.3.2, Sun SPARC Solaris 2.x, Developer 2000, SQL*Plus, Windows 95/NT.

Responsibilities:

- Performed regular Oracle database backups and tuning, and PL/SQL tuning
- Created modules for Contractors, Electricity Boards, Industrial Customers, Employees, and Inventory
- Maintained records on personal information, financial information, and projects for the Contractor, Electricity Board, and Industrial Customer Modules
- Contributed to maintaining personal records, work schedules, and employee type (part-time or permanent) for the Employee Module
- Maintained records for items in stock, condition of items, and pricing details for various sites including the Company Branch Warehouse

- Managed DBA activities performed, including set up of Oracle user accounts and passwords
- Created database, table spaces, schemas, performed database tuning, SQLloading, backup of data and relevant files, backup and recovery, and query optimization
- Designed and developed GUI screens using Developer 2000
- Performed regular backups and recoveries

EDUCATION

B.S. (Electrical Engineering), University of Osmania, Hyderabad

PROFESSIONAL CERTIFICATIONS AND TRAINING

Oracle Certification: Oracle Certified Database Administrator

Oracle, Attended numerous Corporate Training Programs for all kinds of Oracle products including Oracle 11i and 9i

Jay Varner

Data Migration Practice Director

PROFILE

Mr. Varner has over fifteen years of increasingly responsible experience in database design, development, deployment, and associated programming. The past twelve years have been devoted exclusively to the elections (voter registration) process – incorporating a broad scope of duties ranging from customer support to system design and implementation. Data migration has been a primary focus for Mr. Varner and he has successfully converted both large and small volumes of data from a diverse array of original formats into modern database systems.

Some noteworthy projects where he played a lead role include a full data migration for Los Angeles County (nearly six million voters residing in over 6,000 precincts with over 500,000 street range entries), a full migration for King County, Washington with over two million voter records, and the migration of over 400 counties into six state-wide HAVA compliant systems.

Mr. Varner is very focused on customer satisfaction and effectively communicates technical concepts to non-technical personnel.

TECHNICAL SKILLS

- Trained and experienced in the administration of all Microsoft Operating Systems.
- Trained and experienced in the administration of the SCO UNIX Operating System.
- Trained and experienced in the administration and implementation of Microsoft SQL Server, including database design, TSQL (stored procedures, triggers, views), deployment, and replication.
- Significant experience with configuration, management, and use of Oracle database systems;
- Considerable experience with networking concepts, concerns, and equipment (VPN, Routers, Firewalls, etc.)
- Experienced with many database implementations, from proprietary flat files (ASCII and EBCDIC), to BTrieve, Dbase, Foxpro, Access, Oracle, and SQL Server.
- Proficient in most Microsoft Office products (Word, Excel, PowerPoint, Project, FrontPage), as well as WordPerfect and Lotus.
- Trained and experienced with Data Junction, the leading tool for migration of data, as well as the Data Transformation System incorporated in SQL Server and Oracle Warehouse Builder.
- Experienced in Citrix Administration, Oracle Database Conversion, Multiple Database Systems Integration, Information Engineering, Conversion of Voter Registration Data, and VRS System Testing and Implementation.

PROFESSIONAL EXPERIENCE

Saber

Projects: Electus – Centralized Voter Registration
Role: Data Migration Practice Director/Senior Analyst 04/04 – Present

Mr. Varner currently serves as the Data Migration Practice Director, providing conversion and profiling services across six vertical product offerings. As a Senior Analyst, Mr. Varner was involved in the following projects: Oregon Centralized Voter Registration (OCVR), Missouri Centralized Voter Registration (MCVR), Mississippi State Election Management System (SEMS), Maryland Centralized Voter Registration (MDVOTERS), Montana Votes (MTVOTES), and Iowa (IVOTERS) centralized voter registration Projects.

The centralized registration projects consist of the customization of Electus, which is a Help America Vote Act (HAVA) compliant voter registration and election management system. This includes a database consolidation, which will centralize disparate data currently stored by over 400 counties, across six states, into a single centralized database.

In his role as a Senior Analyst, his responsibilities include:

- Managing the data migration track of the project
- Performing and documenting application functionality testing
- Advising on design and functionally features of the system
- Supervising user documentation
- Providing user training for county officers

Data Information Management Systems (later Diebold), Sacramento, California
Role: Senior Analyst/Director of Programming 06/95-04/04

DIMS has been providing Voter Registration Software to County governments on the West Coast for over twenty years. They were purchased by Diebold, Inc. in 2003.

Responsibilities:

- SQL Server database design, administration, and optimization
- Supervise, distribute, evaluate, and contribute to workload management related to development and enhancement of all DIMS software
- Extensive experience in data migration and manipulation for new and existing customers (sole responsibility for more than thirty migration projects)
- Responsible for all hardware recommendations and purchasing
- Responsible for initial installation, configuration, and troubleshooting of all DIMS applications, including hardware and network configuration
- Lead position in all 28 installations of the primary VR application, as well as over 20 installations of SCO UNIX
- Designed, developed, and maintained the corporate web site
- Performed ongoing customer support, quality control, and troubleshooting

Western Area Power Administration (Department of Energy), Sacramento, California
Role: Systems Analyst **06/92-06/95**

Responsibilities:

- Develop custom database applications for various departments using Foxpro and BTrieve
- Developed a near-real-time application to monitor pump output, energy consumption, and water levels on the California Aqueduct
- Primary on a (2-year) project to replace the data collection and billing system for the Power Billing Department. Installed, configured, and maintained the primary meter-reading software package; and verified the regular collection (at substations and dams), compilation, and transmission of meter data for billing purposes.

EDUCATION

B.S. (Computer Science), California State University, Chico, California

A.S. (Computer Science), Yuba Community College, Marysville, California

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Venkat Garla

Lead Architect & Software Development Manager

PROFILE

Mr. Garla has over five years of experience as a Software Development Manager/ Systems Analyst. He is well versed in developing various types of applications for the public sector. He has good problem solving and programming skills, and the ability to learn and use new systems. He is a team player, is results-oriented, and has excellent communication skills.

AREAS OF EXPERTISE

- Proficient in application development using VB.Net, C #, Visual Basic 6.0, Cold Fusion 4.5/5.0, ASP, SQL and PL/SQL.
- Extensive exposure to Object Oriented Design and Programming in C++ and Visual C++.
- Strong working knowledge of database design and development in Oracle and SQL Server.
- Very good Knowledge in the field of Networking and Telecommunications.
- Developed dynamic web applications involving Javascript, VB Script and HTML.
- Proficient in Dream Weaver, Microsoft FrontPage, Macromedia Fireworks, Flash.
- Good knowledge of Crystal Reports and Active Reports reporting tools.
- Good experience in software design, development and implementation on Windows.
- Good knowledge of Concurrent Versions System (CVS), Visual Source Safe (VSS) and Microsoft Team foundation Server versioning tools.

PROFESSIONAL EXPERIENCE

Saber Consulting, Inc., Salem, OR
Client: Maryland Secretary of State's Office
Project: Maryland Voter Registration System (MD VOTERS)

The Maryland Voter Registration System (MD VOTERS) is a HAVA-compliant application designed to fully automate the process of voter registration, conduct and manage elections, absentee voter management, ballot processing and also maintaining election workers records, petitions for statewide implementation.

Responsibilities:

- Design, development and testing of multiple modules.
- Involved in Elections Management, Petitions, Election Workers, Absentee Voters Management and Ballot Processing modules.

Environment: VB.Net, Oracle 10g, Team foundation server.

Saber Consulting, Inc., Salem, OR
Client: Iowa Secretary of State's Office
Project: Iowa Centralized Voter Registration System (I-Voters)

The Iowa Centralized Voter Registration System (I-Voters) is a HAVA-compliant application designed to fully automate the process of voter registration, election management, absentee voter management, ballot processing and also maintaining election workers records, petitions for statewide implementation.

Responsibilities:

- Analysis, development and testing of multiple I-Voters modules.
- Mainly involved in Elections Management, Absentee Voters Management and Ballot Processing.

Election management deals with setting up of contests and measures, defining candidates, generating and maintenance of the Election register and also capturing the voting history of the voters who cast vote in an election.

Ballot processing and absentee management modules deal with the ballots that were sent to the voters who chose to vote as an absentee.

Environment: VB.Net, Oracle 10g, CVS.

Saber Consulting, Inc., Salem, OR
Client: Mississippi Secretary of State's Office
Project: Statewide Election Management System (SEMS)

The Statewide Election Management System (SEMS) is a HAVA-compliant application designed to fully automate the process of voter registration, maintaining election workers records, petitions, elections, districts, precincts, campaign finance maintenance and Jury management for statewide implementation.

Responsibilities:

- Analysis, development and testing of multiple SEMS modules.
- Mainly involved in Voter Registration module.

Voter Registration deals with registering the voters into the centralized system and maintaining their information. System decides if a voter is eligible to vote in an election based on the information of the voter.

Environment: VB.Net, Oracle 10g, CVS.

Saber Consulting, Inc., Salem, OR
Client: Missouri Secretary of State's Office
Project: Missouri Centralized Voter Registration System (MCVR)

The Missouri Centralized Voter Registration (MCVR) system is a fully automated application to register voters, conduct elections and maintain petitions. This is also a fully HAVA-compliant system.

Responsibilities:

- Development and testing of multiple MCVR modules.
- Involved in Petitions module.

Petition module deals with the creation and maintenance of petitions. Sampling of the voter signatures and deciding if the petition is passed or not is achieved using this module.

Environment: VB.Net, Oracle 9i, CVS.

Saber Consulting, Inc., Salem, OR
Client: Oregon Secretary of State's Office
Project: Oregon Centralized Voter Registration System (OCVR)

The Oregon Centralized Voter Registration (OCVR) system is a HAVA-compliant application designed to fully automate the process of voter registration, maintaining election workers records, petitions, elections, districts, and precincts for statewide implementation. OCVR will consolidate the voter registration lists currently stored separately by the 36 counties into a single centralized database.

Responsibilities:

- Development and testing of multiple OCVR modules.
- Involved in Election Management and Ballot Processing modules.

Election module deals with the creation of Elections, Races, Measures, and Publishing the contests to other counties and including the contests published by other counties. It also deals with the creation of Poll book for an election and allows sharing a race to different political parties. Dealt with the ordering of Contests on the ballots, maintaining election budgets and results.

Ballot processing module deals with processing the ballot once it is being returned by the voter. Dealt with checking if the voter has returned multiple ballots, verify the ballot information and the signature to decide whether to accept or reject the ballot.

Environment: VB.Net, Oracle 9i, CVS.

Saber Consulting, Inc., Salem, OR
Client: Oregon Public Employee's Benefit Board (PEBB)
Project: Benefit Management System (BMS)

BMS is a HIPAA compliant secure web-based benefit management system. The BMS system will automate the benefit management process for all State of Oregon members. BMS integrates and synchronizes records, data, and the underlying benefits management process into a single automated information system tying in the different external entities (PEBB databases, four university system databases, eleven insurance carriers).

Responsibilities:

- Development, testing, and documentation.

Environment: PL/SQL, HTML, JavaScript, Oracle

Saber Consulting, Inc., Salem, OR
Client: Oregon Public Employee Retirement System (PERS)
Project: Remittance Advice System (RAS)

RAS is an application for creation and of tracking remittance advice for employers.

Responsibilities:

- Design, development, testing, implementation, documentation and user training.

Environment: Visual Basic 6.0, Microsoft Access

EDUCATION

M.S. (Computer Science), Texas A & M University, Commerce, Texas

MASTER'S PROJECTS:

CPU Scheduler:
Designed a CPU Scheduler, which schedules the processes that are in job queue. Four scenarios were taken each containing 20 processes. Each process has different arrival times and CPU bursts and priorities. The processes are scheduled for four different Algorithms – Multilevel Feedback queue, Round Robin Algorithm, Shortest Job First Algorithm, High Response Time Next Algorithm. The results for each Algorithm are analyzed and graphical output is produced showing the Turn around time, Wait time and Total time and Throughput.

Environment: Microsoft VC++

Paging Simulation:
Simulated the Paging concept of Memory allocation by Operating system for multiple processes using linked lists.

Environment: Microsoft VC++

C++ Compiler (Parser):
Developed a C++ Compiler (Parser) simulation which checks the user entered grammar for all the syntax rules and gives appropriate message depending on whether the grammar is valid or not. Designing was done using LR (1) algorithm.

Environment: Microsoft VC++

Star Jewelers:
Designed a web interface for an online jewelry store named Star Jewelers. Database was maintained in MS Access. IIS was used to handle the client requests in Windows NT environment. Active Server Pages were used to implement the project Online. This project covered all the phases of a system Development Life cycle i.e.; analysis, design, programming, implementation, testing and support. This is a group project. I was involved in web designing and database construction.

Environment: MS FrontPage 2000, Visual Interdev, ASP, MS Access, IIS, MS Project, MS Visio.

Solitaire Game Simulation:
This project simulates the card game Solitaire. Different classes were used for different components of the game like, deck class, pile class and column class which holds the respective cards. All the movements of the cards are checked for the legal movement rules before accepting a move. Concepts like Composition, Association and Operator overloading are used in implementing the project.

Environment: Microsoft Visual C++

Holly M. Howells

Testing Manager

PROFILE

Ms. Howells is an IT professional specializing in centralized voter registration systems. She has been involved in functional analysis, quality assurance, training, and testing for the applications developed and implemented in Oregon (OCVR), Missouri (MCVR), Mississippi (SEMS), Maryland (MDVOTERS), Montana (MTVOTES), Iowa (IVOTERS), Colorado, and New York. Her recent role has been that of Functional Analyst and Tester, providing comprehensive testing and analysis of system functionality with regard to business process and federal laws.

PROFESSIONAL EXPERIENCE

Saber

Project: Various Centralized Voter Registration Systems
Role: Functional Analyst and Tester **03/06 – Present**

As a Functional Analyst and Tester, Ms. Howell's responsibilities include:

- Comprehensive testing
- Anticipating functionality with regard to business process and federal laws
- Coordinating across departments in a multi-cultural team environment
- Analyzing, prioritizing, and directing support requests to technical team members
- Providing direct end user support
- Preparing and presenting training curriculum to technical and support team members, as well as client end-users

Project: Various Centralized Voter Registration Systems
Role: QA Analyst and Trainer **04/05 – 02/06**

As a QA Analyst and Trainer, Ms. Howell's responsibilities included:

- Assuring quality and verifying requirements of elections software
- Creating and implementing new hire training materials
- Performing bug isolation, regression testing, black box, and automated tool testing
- Audio/visually recording and holding live Go To Meeting training sessions
- Performing training sessions for end users

EDUCATION

B.A. (Speech Communication), Oregon State University, Corvallis, Oregon

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Steve Toft

Technical Writer

PROFILE

Mr. Toft has twenty-one years of experience as a technical writer and trainer in the IT industry. He is currently managing the technical writers and trainers who provide the user documentation, training materials and application instructions for projects in all of Saber's vertical markets.

AREAS OF EXPERTISE

- Training users of software applications
- Writing, editing user guides, training curricula and other materials
- Publication design
- Web design
- Project management

TECHNICAL SKILLS

Software: MS Word, MS Access, MS Excel, MS PowerPoint, MS Outlook, Help and Manual 4.2 (similar to RoboHelp), SnagIt 7.0 (screen capture utility), Camtasia Studio (computer video production), Adobe PhotoShop, Adobe Acrobat Distiller, HTML / CSS, Macromedia HomeSite, PageMaker, QuarkExpress

PROFESSIONAL EXPERIENCE

Saber

Role: Training and Documentation Manager/Trainer 2004 – Present

Training and Documentation Management

- Manage technical writers and trainers to provide user documentation, training materials and application instruction for users of Saber's voter registration and election management software for 6 states (Oregon, Iowa, Missouri, Montana, Maryland and Mississippi).
- Oversee all training of Oracle-based products that include Oracle Discoverer, Oracle Designer, Oracle Reports, Oracle Portal, and Oracle Forms.
- Oversee all curriculum development for Saber training to internal and external users for Oracle-based products.

Training Experience

- Electus, Saber's Elections Management Product
- Personally delivered training on all features and functions in Oregon, Missouri and Mississippi.
- Delivered training on Discoverer-based ad hoc reports to power users of the product for these states.
- Demonstrated product to members of the Oregon Legislature
- Managed the development of all training curriculum and delivery of training to the states for which Saber is implementing this Product (Oregon, Mississippi, Missouri, Maryland, Iowa and Montana)
- Electus trainee user base includes about 2000 users in over 400 counties among those six states

Sirius Computer Solutions / Symatrix Technology, Beaverton, OR

Role: Customer Support Analyst / Trainer 2001 – 2004

- Taught Lotus Domino system administration classes
- Provided Lotus Domino administration support to clients in the field
- Provided help desk support for customers with support agreements
- Wrote and edited collateral materials

Advanced Information Solutions, Inc., Lake Oswego, OR

Role: Web Projects Manager 11/99 – 01/01

- Oversaw implementation of client web site projects
- Web site design and ongoing site maintenance using SQL database, HTML and proprietary Visual Basic engine
- Supervised one other person (web designer)

Role: Training and Staffing Manager 10/96 – 11/99

- Recruited staff
- Trained clients on AS/400 operations and Query/400 data reporting tool
- Oversaw daily operation of service bureau, providing outsourced statement processing for a Portland-area print and mail firm.

Role: Service Bureau Manager 06/93-10/96

- Oversaw service bureau processing of telephone company monthly subscriber statements
- Oversaw quality control testing of processing software changes

Western Teledata, Inc. (purchased by AIS in 1993), Stayton, OR

Role: Technical Writer **1989 – 1993**

- Documented software for telephone companies, including AR, AP, CABS (Carrier Access Billing System), Patronage, GL

OrCom Systems, Inc., Bend, OR

Role: Technical Writer/Trainer **1985 – 1989**

- Trained clients to use utility software for electric, water and gas utilities, including AR, AP, Payroll, General Ledger and other modules
- Wrote online, end user documentation for this software

Western Communications, Inc., Bend, OR

Role: Newspaper reporter **1981 –1984**

- Wrote news and features for The Bulletin, a daily Bend newspaper.

EDUCATION

B.A. (Journalism), University of Oregon, Eugene, OR

PROFESSIONAL CERTIFIATIONS

- IBM Certified System Administrator - Lotus Notes and Domino 6
- IBM Certified Instructor - Lotus Notes and Domino 6 Administration
- Certified Lotus Professional (R5)
- Certified Lotus Instructor (R5)

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Shawn Wagoner

Helpdesk Manager

PROFILE

Mr. Wagoner has a proven track record of effectively managing people and delivering impacting results. Mr. Wagoner has worked with a variety of support functions to include Engineering, Quality, Manufacturing, Sales, and Service. His focus over the last ten years has been building result oriented teams, streamlining processes for maximum efficiency, and automation of sophisticated reporting for multiple users and purposes.

PROFESSIONAL EXPERIENCE

Saber

Role: Helpdesk Manager **11/06 – Present**

- Responsible for delivering customer service specific to the plan purchased by clients (Platinum, Gold, and Silver) in support of their Elections software and hardware needs.
- Managed 15+ Technical Support agents, created job descriptions & pay grades, and coaching employee performance.
- Developed SharePoint site which created a foundation for information to be collected and shared for all Tier 1 support use (i.e. procedures, guidelines, reference material, team calendar, etc.).
- Created and documented controlled processes such as: product support & customer feedback process, issue generation standards, FAQ's for both hardware and software products, training process, and overall Elections manual.
- Developed call and e-mail monitoring specifications to be used when monitoring agent performance.

InFocus Corporation

Role: Customer Support Manager **2003 – 09/06**

- Managed 25+ agents and order entry personnel within Technical Support and Customer Service teams, which included recruiting, hiring (temporary and regular staff), and termination. Creating and updating job descriptions, coaching, employee development, reviews and training.
- Launched new service programs to include Sales at the Point of Service (SPOS), which resulted in a run-rate of over 1.6 million in revenue per quarter (30% margin) within 12 months.
- Designed and implemented 100% call logging application and associated data entry processes. This allowed for a 50% reduction in data entry transaction time

through integrating and automating creation of customers, transferring ownership of product, and initiating service requests within Oracle 11i.

- Designed and implemented a monitoring application capable of scoring on multiple categories for the purposes of call shadowing agents while on the phone, outgoing e-mails, and accuracy of order entry.
- Developed employee and overall call center metric reporting to provide a foundation for accountability and tracking of performance (service level, abandonment rate, calls offered, answered, returned, handle time, not ready time, etc.).
- Created a schedule leveraging work force management software, which allowed the call center to achieve world-class service levels of 90% of the calls answered within 90 seconds and abandonment rate of less than 3% within 90 days.
- Participated in the re-design of the corporate call tree, which included the scripts written to route calls to applications/skillsets, defined call treatment conditions, and messages played for customers calling into the call center.

Role: Corporate Quality Data Analyst 1999 – 2003

- Developed the quality data warehouse using corporate application tools (Oracle, Access, and ProClarity)
- Developed methodologies for collecting and aligning worldwide quality data and reporting tools for supplier, manufacturing, and customer service functions.
- Participated on Oracle 11i implementation team; developed business requirements, process mapping, testing, and training. Implemented Oracle Quality and Nonconformance in quality functions and factory repair centers in US and Europe
- Translated quality data into actionable lessons learned for feed back into the Product Development Cycle and used to drive corrective action and continuous improvement initiatives

EDUCATION

B.S., Management and Business Information Systems
George Fox University, Newberg, OR

Gurminder S. Bhalla

DBA

PROFILE

Gurminder Bhalla has eight years of experience in IT industry as an Oracle DBA with strong analytical, organizational abilities, communication and technical skills as both physical and logical database administrator besides being a team player in managing the administration of multiple databases for the enterprise. Key strong points include:

- Expertise in Implementation, Administration, Performance Tuning, disaster recovery and business continuity planning of number of databases on multiple platforms such as UNIX and Windows servers.
- Expert in resolving issues from simple SQL tuning to complex database issues that involves whole nine yards of analyzing, evaluating, fact finding, troubleshooting and documenting issues.
- Excellent skills in networking with TCP/IP, NFS, DNS, NIS, HTTP, FTP, VPN.
- Solid understanding of power user requirements with respect to building development and test/QA databases besides refreshing databases from production for development needs.
- Ability to communicate with external customers under different capacities.
- Dealing with different software vendors for product evaluation and technical staff for database/server capacity planning, project management and future growth as the business grows.
- Building Best practices (OFA), standard operating procedures (SOP) and technical operating procedures (TOP) for database administration, backup/recovery and standby databases.
- Technical writing in preparing recovery disaster plans for mission-critical servers and methods and procedures for usage of tools and process.

TECHNICAL SKILLS

Databases: Oracle10g, Oracle9i, Oracle8i, Oracle8, SQLServer

Application Severs: Web logic, BroadVision, Websphere & Iplanet

Operating Systems: SUN Solaris 8/9, HP UX-11i, Windows 2K, Redhat & CentOS

Tools: Oracle Enterprise Manager, DBA Studio, ERWIN 4.1

Utilities: SQL*Loader, SQL*Net /Net 8, Export/Import, RMAN

Backup Tools: Veritas NetBackup 4.5/5.1

Languages: SQL *Plus, PL/SQL

Third Party Tools: Secure FX, Secure CRT, Reflection, Exceed, VPN & Infoman

PROFESSIONAL EXPERIENCE

Saber

Physical DBA Role: **11/06 – Present**

- Supported & Managed RAC databases on Linux environment for different state governments projects.
- Monitored Advanced Data Replication in production environment & resolved day-to-day issues.
- Managed the database tape backup through the third party tool HP openview management software.
- Testing & QA data refresh done with production data on regular basis.
- Worked closely with developers for database performance issues.
- Supported Citrix based web application metaframes for production as well as testing and QA environment.
- Automated various processes by configuring DBMS Jobs and CRON Jobs in different production boxes.
- Monitored the production environment with third part tool Indicative.

Role: Logical DBA

- Worked closely with team of developers to implement Application and database issues.
- Knowledge sharing with in peers and other groups.
- Automate System administration tasks as scripts provided by vendor.
- Provided 24x7 support for production databases and application.

Environment: Oracle 10g/9i, OWB 10.2.0.1, Linux, OEM 10.2.0.1, Toad 8.3, Hpopenview, Indicative 7.5. & Citrix

3S Systems Inc

Role: Physical DBA **04/06 – 10/06**

- Installed and regular upgrades of different databases on unix operating system.
- Applied patches to databases as and when required.
- Monitor and tune System performance proactively for any system related issues with Automatic Database Diagnostic Monitor (ADDM) in testing.
- Implemented physical standby database and tested failure/recovery procedures.
- Configured Standby Databases using Dataguard in testing environment.
- Configured Standby Database using in house scripts developed for Archive Log Shipping and synchronizing standby database.
- Worked on disaster recovery plans for production as well as testing environment.
- Performed daily hot Backups and Restored critical data according to user's request.

- Worked closely with other teams for all OS/database related changes in production / testing environment.
- Helped the developers in troubleshooting / resolving the performance problems by tuning the code.
- Automated various processes by configuring DBMS Jobs and CRON Jobs.
- Database Replication by using Materialized Views.

Role: Logical DBA

- Performed database maintenance activities such as performing de-fragmentation, rebuilding the tables / indexes, adding data files.
- Maintain / document database administration procedures and errors.
- Worked closely with developers for performance issues in databases.
- Audited the databases activities for data access and security issues.
- Used vendor provided scripts to automate the system administration.
- Provided 24x7 support for production databases.

Environment: Oracle 10g/9i/8i, RMAN, weblogic, websphere, Sun Solaris, INFOMAN & OVSD.

Hewlett Packard

Role: Oracle DBA/Physical DBA 03/05 – 02/06

- Installation and periodic upgrades of different databases on different versions UNIX boxes as per Change Management procedures.
- Ongoing refresh of development and test/QA databases from production – planned as well as on-demand.
- Configured Veritas NBU client, RMAN for hot backups and periodic restoration/recovery of databases.
- Configured OEM as well as OMS (Oracle Management Server).
- Configured Physical Standby database and periodic transportation of logs to the Disaster Recovery site.
- Responsible for implement / testing of all the databases patches, application release upgrades / patches.
- Track record of database integrity with minimal downtime, and complete safeguarding of data.
- Supported high availability databases with Guaranteed protection Data Guard mode.
- Support the Web logic /Broad Vision Support Team in the completion of schedule Run Changes such as code deployments, upgrades/patch installations, MW configuration changes, and environment re-syncs and problem fixes.
- Work closely with Unix team for all Unix related changes in production / testing environment.

Logical DBA

- Performed database maintenance activities such as de-fragmentation, rebuilding tables / indexes, adding data files, rollback segments and tablespace management.
- Manage database security, password expiration and database audit
- Monitor and tune database as well as system performance.
- Automate System administration tasks as scripts provided by vendor.
- Resolved day-to-day networking issues & escalates problems to Hardware vendor.
- Maintain / document database administration procedures and errors.

Environment: Oracle 9i/8.1.7.5, RMAN, SQLServer2000, Sun Solaris, HPUNIX, Windows 2000,weblogic, websphere, Iplanet, NETBACKUP, Veritas Cluster, INFOMAN & OVSD

Role: Manager

- Regularly attended all team meetings to understand the management expectations and requirements.
- Regularly attend change management & problem management meetings.
- Design disaster recovery plans for mission critical systems.
- Participated in design discussions to support project.
- Participated actively in conference calls with different vendors.
- Knowledge sharing with peers and others technical staff.
- Producing and maintaining documentation to controlled standards, including project plans and status reports.
- Complete 24X7 support for production databases – both master as well as snapshot sites for online user community.

Digital Caravan

Role: Oracle DBA **08/00 – 11/04**

- Managed all user accounts, passwords and maintaining database security through user profiles.
- Install and configure Oracle & Windows NT servers, monitor the database functions.
- Performed upgrade on different databases as and when required.
- Performed database maintenance activities such as performing de-fragmentation, rebuilding the tables / indexes, adding data files, adding rollback segments.
- Implemented locally managed tablespaces with uniform extent sizing to reduce the fragmentation.
- Responsible for daily hot Backup. Restored critical data according to user's request.
- Responsible for implement / testing of all the databases patches.
- Monitor and tune System performance proactively for any system related issues.

- Automated System administration tasks as scripts provided by vendor.
- Design disaster recovery plans for mission critical systems.
- Worked closely with Unix teams for regular change records for code deployment for production as well testing environment.
- Worked very closely with developers to optimize SQL queries using TKPROF, Explain Plan, and SQL Trace.
- Used Oracle Statspack utility to troubleshoot performance problems of databases, analyze the statspack reports and apply fix/configuration changes in the databases as per vendor's recommendations.
- Responsible for implement / testing of all the databases patches, application release upgrades / patches.
- Responsible for maintenance for physical standby databases.
- Implemented the data replication by snapshots
- Database integrity was maintained with complete safeguarding of data with minimum downtime.
- Regularly attended all team meetings to understand the management expectations and requirements.
- Participated actively in conference calls with different vendors.
- Shared skills / technical information with peers and others.

Environment: Oracle 8i/8.0/7.3.4, RMAN, HPUNIX, Windows2000, Redhat, CentOS, weblogic, & Remedy

Bank of Punjab (India)

Role: Programmer/DBA 05/97 – 04/00

- Involved in developing Procedures and functions using PL/SQL, wrote database, triggers, procedures and packages.
- Automated the various tasks (like purging process, archiving the data etc.) by writing packages and scheduling them through DBMS Jobs.
- Helped senior database administrator in creating user accounts, schema and objects.
- Involved with senior database administrator to reorganize the tables.
- Performed Database Maintenance activities like reducing fragmentation, relocation of Objects, Adding Data files, adding Rollback segments and redo Log Files.
- Involved in SQL Tuning using Explain Plan, SQL trace and TKPROF utilities.

Environment: Oracle 7x, HPUNIX, Windows NT/3.x, SQL*Plus

PROFESSIONAL CERTIFICATIONS AND QUALIFICTIONS

Certifications

- Oracle Database 10g (OCP as Database Administrator)
- Sun Certified System Administrator Solaris 9
- ITIL Foundation Certificate in IT Service Management
- Oracle 9i Certified Professional (OCP)
- Oracle 8i Certified Professional (OCP)

Qualifications

- MS Engineering

Ramesh K. Medikonda

Senior Network Engineer

PROFILE

Mr. Medikonda has over five years of professional experience of Network and System Integration Management in large-scale networks. His experience includes installation and administration on Windows NT4.0/2000/2003 Servers, Exchange 5.5/2000/2003 Servers, Linux 2.4.9-e.49/9.0,8.0/7.x/6.x, Citrix Meta frame Servers, Novell Netware, Cisco switches, Cisco Routers, Juniper and PIX Firewalls. He also has extensive experience in TCP/IP design and the implementation and configuration of Internet and Intranet servers. Mr. Medikonda is a Cisco certified Network Associate from CISCO (CCNA) and a Microsoft certified System Engineer (MCSE) in Windows 2000.

PROFESSIONAL EXPERIENCE

Saber

Role: Senior Network Engineer **01/05 – Present**

As a Senior Network Engineer, Mr. Medikonda has various networking and system responsibilities, including:

- Designing, testing, building, implementing and troubleshooting Active Directory (AD) in large environments on Windows 2000 and 2003 servers, and in migrating Active Directory from NT 4.0 to 2000/2003
- Editing Active Directory schema, transferring FSMO roles, enabling Global Catalogs, creating OUs, and configuring additional DC and replications of AD
- Creating and modifying user accounts and local, global and universal groups in AD; implementing GPO and creating security, distribution groups and roaming profiles; troubleshooting domain-related issues and user account authentication problems
- Configuring and maintaining various security elements, including Juniper NetScreen 204/208 Firewalls Juniper NetScreen, CA eTrust Antivirus, McAfee Virus Scan Enterprise, Symantec AntiVirus, TOP layer IPS 5500-100, Proventia device 100 G-Series, Cisco routers and switches, and VPN tunnels.
- Configuring F5 product BIG IP 1000, virtual servers, pools, nodes, monitoring instances, SNMP, and rules on BIG IP
- Configuring BrightStor ARCserver Backup r11.1, clients on Windows and Linux servers, Agent for Open files, Oracle, SQL, and VSS
- Creating backup strategies and making regular backups/restores
- Designing, testing and building Indicative 7.1.1 for Network Management and configuring DMS servers, and client agents
- System administration of Windows 2000 and 2003 Servers, and Linux 2.4.9-e.49 Enterprise servers

- Designing, testing, building and implementing ADS, DFS, DNS, DHCP, WSUS, WINS, IIS, FTP, ISA, RAS, VSS and VPN services in MS Windows 2003/2000 servers.
- Designing a consolidation strategies
- Installing and configuring SQL 8.0 and Oracle 10g on Windows 2003 Servers
- Configuring Citrix MetaFrame presentation Server for windows 4.0.2, Citrix web Client, secure gateway 2.0 for MetaFrame 2.0.0, Web Interface for MetaFrame Presentation Server 3.0.37544
- Network analysis and documentation for various platforms and building networks from scratch

Environment: Dell Power Edge 1850/1750 servers, Dell Power Edge 6600/1420SC/2500SC Servers, Dell power edge 1300/1400/2500/2600 servers, HP ProLiant DL 380/360 G4/140 servers, Juniper NetScreen 204/208/ 5 GT Firewalls, F5 product BIG IP 550, F5 product 3DNS 520, Top Layer IPS 5500-100, Proventia 100 G-Series, Cisco Catalyst 3550/2950 Switches, SAN Devices, Backup Devices: HP storage works 1/8 auto loader, HP Integrity RX 2600, Dell Power Vault 114 T Ultrium2 LTO, HP Ultrium 200GB/400GB Data Cartridge-Ultrium1/Ultrium2.

Operating systems and server applications: MS Windows 2000/2003 servers, Windows 2000/XP Professional, Linux 2.4.9-e.49 enterprise servers, Oracle 11i/ 10g/9i, SQL server 8.0, ADS, DNS, DHCP, DFS, RAS, VPN, Citrix web Client, Citrix MetaFrame presentation Server for windows 4.0.2CA, Secure gateway 2.0 for MetaFrame 2.0.0, WSUS Server- Windows server update services, CVR Application-Centralized voter registration, CA eTrust Antivirus 7.1.192, McAfee Virus Scan Enterprise 8.0.0, Symantec AntiVirus 9.0.0.338, CA BrightStor ARCserver Backup r11.1, HP OpenView Storage Data Protector A.05.50 version 05.50.0330, Tripwire 3.1, IXIA QCheck 3, Putty 0.58, Indicative 7.1.1, WinSCP 3.7.1, IPSec Tunnels & VLAN's On Cisco Switches.

Cadbury Schweppes – Plano, Texas

Role: Windows Specialist and Project Coordinator 08/05 – 11/05

Cadbury Schweppes is one of the largest international beverage and confectionery companies in the world with a market capitalization of £11 billion (August 2005). The project objective was to evaluate Cadbury Schweppes America's current IT environment and outline a strategy to consolidate data centers, servers and storage infrastructure where possible for increased efficiencies, increased levels of services and reduced total cost of ownership (TCO).

Mr. Medikona's responsibilities included:

- Gathering information from all the Zones – Cadbury Schweppes is distributed in 178 locations in US and Canada, Mecca, Brandina and Southern Cone
- Participating in various data center meetings on systems, network, database, security, applications, people, support, storage, change management, and problem determination
- Creating the assessment tool to capture the information in the form of tool/templates and interacting with system, network, applications, support and data center personnel

- Reviewing the collection assessment data, entering the site-related data into the assessment tool, and mapping it to the database
- Collecting the data related to hardware, software, vendors, licenses, change management, and escalation mechanism
- Meeting with the application owners to understand the applications and to plan for consolidation of systems and storage
- Providing recommendations related to consolidation opportunities, optimizing utilization opportunities, process improvements, vendor contracts profiling, license management and cost reduction opportunities, storage utilization and layout optimization opportunities

GETS - GE Transportation Systems, Erie, PA/BASF – BASF Corporation, Rockaway, NJ

Role: Senior Network Engineer 09/02 – 07/05

GE Transportation Rail is a global technology leader and supplier to the railroad, transit, marine and mining industries. It provides freight and passenger locomotives, railway signaling and Communications systems, information technology solutions, marine engines, motorized drive Systems for mining trucks and drills, high -quality replacement parts and value added services.

Mr. Medikona's responsibilities included:

- Designing, testing, building, implementing and troubleshooting Active Directory (AD) in large environments on Windows 2000 and 2003 servers, and in migrating Active Directory from NT 4.0 to 2000/2003
- Editing Active Directory schema, transferring FSMO roles, enabling Global Catalogs, creating OUs, and configuring additional DC and replications of AD
- Creating and modifying user accounts and local, global and universal groups in AD; implementing GPO and creating security, distribution groups and roaming profiles; troubleshooting domain-related issues and user account authentication problems
- Remote administration on AD with Terminal services, VNC, NetOp Remote Control Tool (Guest and Host Configuration) and PcAnywhere
- Configuring and maintaining various security elements, including Symantec Corporate Edition 10.0 for workstations and notepads, Symantec Enterprise Edition 7.5 for file and network servers, Symantec Mail Security 4.5 for MS Exchange 2000 & 2003 Servers
- Designing, testing, building and implementing MS Exchange 2000 & 2003 servers in a large environment and the migration Exchange 5.5 to Exchange 2000/2003 servers using Microsoft native tools (ADMT and ADC).
- Performance monitoring and troubleshooting of Exchange 2000 and 2003 environments.
- Clustering and Load balancing on Exchange 2000 and 2003 Server environments.
- System Administration on Windows NT/2000/2003 (Advanced and Enterprise) Servers, Red Hat 9.0,8.0/7.x, Red Hat Enterprise 2.0 & 3.0 servers.

- Installing and configuring SQL2000/7.0 and Oracle 9i server on Windows 2000/2003 Servers.
- Designing, testing, building and implementing backup strategies
- Configuring and administering Cisco 5300, 3600, 2600 series routers for WAN connectivity, configuring Cisco Catalyst 4510/2900 series switches, ordering, installing and maintaining the routers with Dedicated T1, IPLC Link and PRI lines with FRSP, and ISDN connections
- Creating and managing RAID 5/1/0

Infrastructure Availability: Dell Power Edge 6400, 6300, 4400, 2400 & 1300 Servers, COMPAQ Proliant 350, 800, 1500, 1600, 3000 Servers, HP LC 2000 Net servers, Sun E 450, 250 servers, Sun Sparc Ultra 10/ 5 Servers, Cisco 5300, 3600, 2620, 2500 series routers, Cisco catalyst 4510, 2924, 1920 Switches, Cisco PIX 520, 515 E Firewalls.

Operating Systems and Server Applications: Windows NT 4.0/2000/2003 servers, Red Hat Linux 8.0,9.0 servers, RedHat Enterprise 2.0/3.0 servers, Win 2000/XP Professional, Exchange server 5.5/2000/2003, ADS, DFS, DNS, DHCP, WINS, FTP, IIS, ISA, RAS, VSS, VPN, SMS , Applications like Oracle 8i/9i/11i, SQL Server 2000/7.0, Office (2000, 2003) suite, Cognos Report Net, Cognos Impromptu 7.0/7.1, TOAD, CISCO VPN Client V 3.6.3, Novell Client V 4.81, Lotus Client 5.0/6.0, SAP Client, Terminal servers, Astaro security Linux 5.1 Firewall, Ghost imaging software, SysPrep1.1, Veritas Backup Exec 10.0 Software With Tree Frog Tape Library.

Lanco Global Systems Limited, Hyderabad, India

Role: System Engineer 05/01 – 08/02

IT solutions and services are delivered to global customers through LANCO Global Systems Inc (LGSI) located in Atlanta and New Jersey in the US and LANCO Global Systems Limited (LGSL) located in Hyderabad, India. The organization specializes in designing and implementing IT solutions and services aligned to business needs of customers.

Mr. Medikona's responsibilities included:

- System administration of Windows NT 4.0/2000 servers, RedHat Linux Fedora 8.0/7.x/6.x, Sun Solaris 7.0/8.0/9.0 servers
- Installing and configuring PDC, BDC, ADS, DFS, DNS, DHCP, WINS, IIS, FTP, ISA, RAS services on Windows NT 4.0 servers and Win 2000 servers
- Installing and configuring terminal services, IIS 4.0/5.0, VSS on Win 2000 server
- Installing and configuring SQL 2000/7.0 server and Oracle 8.x as database servers on Windows/Linux
- Designing, testing, building and implementing Exchange 5.5 and Exchange 2000 Servers as mail servers; configuring Exchange as mail server with Send Mail 8.9.3 relay
- Configuring DNS, Samba, Send Mail and FTP servers on Red Hat Linux servers
- Installing, configuring and administering Apache Web server for web hosting and virtual hosting
- Desktop support for users running on Hp Vectra VE Machines using XP, 2000, NT

- Configuring and administering Cisco 2500, 3600 series routers for WAN connectivity
- Implementing corporate security using Cisco PIX Firewall and configuring VPN between sites
- Managing backups, restores and backup policies

Technical Environment:

- HP LC 2000 Net servers, Windows NT4.0/2000 servers, Windows NT3.51/2000 Professional, Exchange 5.5/2000 Servers, IIS 4.0/5.0, Oracle 7.x/8i, SQL Server 2000/7.0, Office Suite products, PDC, BDC, ADS, DFS, DNS, DHCP, WINS, IIS, RAS, VPN, Terminal services.
- Sun Ultra 10 Servers, Apache Tomcat 5.5.7, DNS, SENDMAIL 8.9.3, Squid Proxy 2.4.on Redhat.
- Cisco 2600, 3600 series Routers and Cisco Catalyst 2920 Switches, Cisco PIX Firewall with NAT Enabled, Configured/Maintained IPLC Link on MLLN and 512kbps Internet leased line on RF for smooth execution of different projects.

EDUCATION

B.E. (C.S.E - Computer Science and Engineering)

CERTIFICATIONS

- **Cisco certified Network Associate from CISCO (CCNA)**
- **Microsoft® certified System Engineer (MCSE) in Windows® 2000**
- Installing, Configuring, and Administering Microsoft Windows 2000Server
- Installing, Configuring, and Administering Microsoft Windows 2000 Professional
- Implementing and Administering a Microsoft Windows 2000 Directory Services Infrastructure
- Implementing and Administering a Microsoft Windows 2000 Network Infrastructure
- Designing a Microsoft Windows 2000 Directory Services Infrastructure
- Designing Security for a Microsoft Windows 2000 Network
- Installing, Configuring, and Administering Microsoft Exchange 2000 Server

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Sunil Dabbiru

Data Migration Lead

PROFILE

Suni Dabbiru has over three years of experience in IT industry and is skilled in Oracle Warehouse Builder Data warehouse tools, Business Objects, Discoverer, and Designer. Sunil is experienced in creation of ORACLE database, Data warehouses/Data marts, and PL/SQL programming. Sunil is an expert in C, SQL server 2000 including strong skills and experience in software development and packaging. Sunil is organized, motivated, broad and accomplished computer skills along with excellent written and verbal communication skills.

EDUCATION

M.S. (Thesis) Electrical and Computer Engineering, Wichita State University, KS

B.Tech. Electrical and Electronics Engineering, Jawaharlal Nehru Technological University, India

TECHNICAL SKILLS

Software: C, C++, Java, Perl, J2EE (EJB, JSP, Servlets), XML, MS Access, Mysql, Oracle, HTML, XML, JavaScript, Visual Studio .NET (VC++, VB), MS Office, Installshield, Win 32 MFC, Matlab, Linux, Windows, Mac OS, SQL server 2000 and PHP.

PROFESSIONAL EXPERIENCE

Saber

Role: Data Warehouse Developer **07/05 – Present**

Saber's Elections Management & Centralized Voter Registration Practice (ELECTUS:www.electus.org) has been developed from the ground up to assist States in implementing the Help America Vote Act (HAVA), especially Section 303 (Centralized Voter Registration) of the Act. Saber's solution encompasses a highly customizable HAVA compliant Elections Management & Centralized Voter Registration system, a world class fault-tolerant, scalable, and secure architecture, and a support program that provides dedicated onsite application and end-user (counties and towns) support. Implemented Statewide Voter Registration and Election Management System for the States of Oregon, Mississippi, Missouri, Iowa, Montana, and Maryland.

Responsibilities:

- Analyze and document the complex election data received from each county from different states and also identify relevant data and complexities in it.
- Review project requirements, help in database architecture, plan development modules, lead system development, draft test plans, provide progress reports to project managers/end clients and participate in end user reviews for migrating data from disparate sources into one centralized data repository per state.
- Install and Configure OWB environments for different state projects.
- Extensively used Oracle Warehouse Builder to load data from sources involving Oracle, Flat files, SQL Server, ES & S, Solutions, State Client, CMS etc to Oracle database.
- Extract, transform, and load data (ETL) from heterogeneous state/county systems to new state repository using OWB 10G, OMB scripts, and PL/SQL.
- Design, create, deploy and execute process flows.
- Used debugger (set break points) to validate the mapping and gain troubleshooting information about data and error conditions.
- Migrate (Export, Import) data of different states across environments (DEV, QA, Data Verification and Production).Developed several PL/SQL routines to implement Address libraries and Precinct information.
- Design and create tables, views, materialized views, triggers, stored procedures, and packages.
- Fine-tuning of SQL queries and views by passing hints and analyzing them using plan_table.
- Document and design the simple and complex mapping for loading the data from staging to Target using various mapping operators, SQL and PLSQL transformations.
- Document and create internal QA packages by writing complex SQL and PL/SQL sub-programs.
- Generated many ad hoc reports for the different states using Oracle Discoverer and Desktop on Citrix Secure Client Application for data verification process and other analytic processes.

Environment: Oracle 10G/9i, PL/SQL, OWB (Oracle Warehouse Builder) 10g/9i, Oracle Designer, Oracle Desktop.

Project: Secretary of State
Role: Data Conversion Plan **12/06 –03/06**

Convert the existing committee data from the existing system to the newly developed database for the Committee subsystem under the data conversion plan. The scope of this plan includes the following

- Identifying the data to be converted.
- Identifying a conversion tool / methodology for the conversion.
- Created development/test environment for the conversion.
- Created conversion scripts for the conversion.

The objectives of this plan were to complete a seamless transition of committee data from the old system to the new system. Extensively used Oracle Warehouse Builder to load data from sources involving Flat files to Oracle database.

Responsibilities:

- Design and create tables, views, materialized views, triggers, stored procedures, and packages.
- Install and Configure Informatica development/QA environments for different state projects.
- Extensively used Oracle Warehouse Builder to load data from sources involving Oracle, Flat files, SQL Server, ES & S, Solutions, State Client, CMS etc to Oracle database.
- Extract, transform, and load data (ETL) from heterogeneous state/county systems to new state repository using OWB 10G, OMB scripts, and PL/SQL.
- Design, create, deploy and execute process flows.
- Used debugger (set break points) to validate the mapping and gain troubleshooting information about data and error conditions.
- Fine-tuning of SQL queries and views by passing hints and analyzing them using plan table.
- Document and design the simple and complex mapping for loading the data from staging to Target using various mapping operators, SQL and PLSQL transformations.
- Document and create internal QA packages by writing complex SQL and PL/SQL sub-programs.

Environment: Oracle 10G/9i, PL/SQL, OWB (Oracle Warehouse Builder) 10g/9i, ERwin4.0, Oracle Designer, Oracle Desktop.

Worldwide Financial Network

Role: Intern Engineer 10/03 – 05/04

- Installshield (Adminstudio) software repackaging, deployment and Installation in the remote networking and storage group.
- Worked on Client/Server tools like SQL Server Enterprise Manager and Query Analyzer to Administer SQL Server 2000.
- Created Stored Procedures, Triggers, Views and Functions for the Application.
- Created Database Maintenance Planner for the Performance of SQL Server which covers Database Integrity Checks, Update Database Statistics and Re-indexing.
- Migrated tables to the Data Warehouse using DTS.

Project Intern, Trendz Information Technologies Limited, Hyderabad, India May 2001 – Dec 2001.

- Product Transaction Master Project using ADO, OLE, data reports in Visual Basic and Oracle.

Small Scale Network Design:

- Designed a network of 16 systems using multiple protocols like RIP, IGRP, OSPF, EIGRP etc., on Cisco Routers (Version-11.2).
- Used OPNET network simulator to carry out the evaluation to compare the routing protocols.

Computer Forensics

- Explored the vulnerabilities of DNS servers using BIND on a Windows server 2000 platform.
- Used DNS tools such as DIG/DNS expert to find the vulnerabilities.

Classroom Operations Support Database:

- Developed and maintained information of Classroom Operations Support Employee database, using Unix and C++.

Control Systems project:

- Determined the Control system stability and simulated Inverted pendulum Using MATLAB

PROFESSIONAL CERTIFICATIONS AND HONORS

- Certified Oracle9i Associate.
- Active member of Phi Eta Sigma Honors society.
- Undergone Training in Microcontrollers and Applications at CETE, Hyderabad and was awarded Certificate of Excellence.

Amit Dass

Programmer Analyst

PROFILE

Mr. Dass is a programmer analyst with proven software development, systems analysis, systems implementation, and training skills. He is personable, a great team player, has excellent problem solving and troubleshooting capabilities, and strong communication skills.

TECHNICAL SKILLS

Smart Devices Programming: ASP.NET Mobile Controls, WML 1.1 and VB.NET. .NET Framework 1.1/2.0 and .NET Compact Framework.

Web Programming: HTML, JavaScript, ASP, ASP.NET, and ASP.NET Web Services.

Programming: C, PL/SQL, WML 1.1, ADO.NET, and VB.NET.

Document Imaging: ImageBasic 3.6 and 3.8, Vision Shape.

Multimedia: Macromedia Flash 5.0, Paint Shop Pro, Adobe Photo Shop 7.0, and Audio/Video Editing.

Database: DB2, Microsoft Access, Microsoft SQL Server, and Oracle-9i.

Cad/Cam - (Simulation): Auto-Cad R13/14, Pro-Engineer, Unigraphics, Ideas, Cadds 5, and Pro-Cast.

Packages: MS Office, NetMeeting, Cool-Biz 5.1, Install Shield, Demo Shield, RoboHelp, Sniffer Pro, and Comnet.

PROFESSIONAL EXPERIENCE

Saber

Project: Elections Management & Centralized Voter Registration system
Role: Programmer-Analyst 01/04 – Present

The Electus (HAVA Compliant) system is designed to fully automate the process of voter registration and election management.

Responsibilities:

- Release management and technical analysis
- Application development, testing & integration of the system
- Object oriented design using VB.NET (GUI, Business Object and Data Access)
- Wrote queries to access data from the database and tested SQL queries (tuning)
- Application design based on (thin) client server architecture
- Involved in test plan creation, wrote test scripts and performed ad-hoc testing

- Data/Image migration
- Migrated and tested data sent by counties for creating one state database.
- Performed database integrity and validation test of data by writing SQL queries and creating reports for county verification.
- Hardware selection, testing, configuration, implementation and support
- Production/personal scanners, handheld barcode readers, network/label Printers

The PRISM Project National Science Foundation – Grant 0086354

Role: Webmaster (Part Time) 11/03 – 01/04

Responsibilities:

- Redesigned web site to share resources between high school teachers and students.
- Created a file server and document retrieval system
- Trained undergraduate assistant in web site maintenance and setup.

The Sage Group

Role: Technical Trainer (Part Time) 08/03 – 12/03

Responsibilities:

- Assisted Verizon Communications workforce in developing computer skills.
- MS Office and Computer Support/Maintenance

Illinois State University

Role: Graduate Teaching Assistant 08/00 – 05/03

Responsibilities:

- Teaching assistant: Computer Programming for Scientists - Fortran, Microcomputer Productivity Tools, and Practical Telecommunications Networking.
- Assisted faculty in grading of graduate/undergraduate courses, curriculum development, lab manual development and testing student skills
- Department web site maintenance (August 2000 to May 2001.)

Tata Consultancy Services – Internet Solutions Group

Role: Assistant Systems Engineer **06/99 – 07/00**

Responsibilities:

- Developed business-critical application on the Internet (ASP 2.0, JavaScript)
- Analyzed functional requirements & prepared ER models for database design.
- Prepared logical and physical data models, performed database normalization.
- Involved in interface, data flow design and client form validation.
- Trained other project groups as part of a continuing education program.
- Helped project group during branch CMM Level 5 Certification in documentation of software metrics and time sheet.

EDUCATION

Master of Science Degree in Applied Computer Science, Illinois State University

Bachelor of Mechanical Engineering, PSG College of Technology (Bharthiar University), Coimbatore, India

PROFESSIONAL ACTIVITIES

Masters Project: Mobile Web Application - Cinema Booking and Ticketing System

- Designed a mobile web application using ASP.NET mobile controls and XML for mobile users to check cinema timings/movies playing and perform ticket booking with cell phones or PDA's.
- Performed front and back end testing using Mobile Emulator and data flow modeling

Research:

- Embedded subliminal messages in Visual Interface Design.
- Ergonomics in computing.

Activities:

- Department representative to the Graduate Student Association (August 2002 to May 2003.)
- Grants In Aid Judge – Evaluated and graded applications for research grants.
- Adopted park and planned welfare activities.
- Internship in College Teaching (August 2002 to December 2002.)
- Experience with different teaching models and strategies.
- Guest lecturer for class: Using Microcomputer Productivity Tools in a Large Class Setting.
- Elearn-2003 Conference: coauthored and published brief paper "ASP.NET Mobile Controls - A Web-based Tutorial."

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Erin Branson

Testing and Quality Control Lead

PROFILE

Erin Branson is a Quality Control Consultant working with the Electus project for the states of Oregon and Missouri. Erin is experienced in testing applications for error, review application logic, and working closely with development team(s) to resolve issues that are discovered. Erin's testing and quality control experience includes quality control testing, application review, mock statewide elections, training, and client services. Erin has also identified application bugs, system errors, along with scheduling staff coverage, and documentation development.

TECHNICAL SKILLS

Software: Microsoft office applications including: Word, Outlook, Excel, Access, Power Point, Visio

Hardware: Basic hardware knowledge (scanner installation, printer setup)

PROFESSIONAL EXPERIENCE

Saber

Role: **QA Analyst/Help Desk Analyst/Help Desk Lead (Current)**
Period: **03/05 – Present**

- Provide Quality Assurance for Mississippi's Statewide Election Management System (SEMS) by working closely with the development team to resolve issues discovered in the SEMS testing environment.
- Provide Customer Support to Mississippi Counties by answering incoming phone calls from the users, tracking issues in the SPIRIT system, and following up with users daily. Much of this work has been done during major statewide elections including the Primary and General 2006 elections.
- Manage the Help Desk team of 12 consultants by maintaining schedules, approving vacation/personal time off, resolving employee conflicts as needed, scheduling ongoing trainings for team members, and handling escalated calls from clients.
- Coordinate with other company employees to schedule Quality Control tests to be preformed on the application prior to the public release

Oregon State Hospital

Role: Mental Health Therapist Technician
Period: 04/04 – 04/05

- Provide one-on-one and group counseling and activities to patients in a secure inpatient facility.
- Monitor and chart patients' behaviors and progress in the program on meeting basic treatment goals.
- Take part in ongoing training to recognize mental health behaviors and consequences.

Salem-Keizer School District

Role: Special Education Instructional Assistant
Period: 02/04 – 04/04

- Work one-on-one with a child with cerebral palsy.
- Provide lesson plans that encourage physical and mental development of the sensory and motor skills.
- Maintain a daily report of student's progress for meeting basic behavior goals and expectations.

EDUCATION

B.S., Human Development and Family Studies with an emphasis in Early Childhood Education; Minor in Psychology
Oregon State University, Corvallis, OR

Tony Demeo

Documentation

PROFESSIONAL EXPERIENCE

Saber

Role: Senior Consultant/Editor **2005 – Present**

- Edit user guides and training materials for database software used by state and local governments for various public services, such as voter registration and election management, and retirement, unemployment and health-care systems.
- Manage and edit writing projects completed by team in India.

Lionbridge Technologies, Inc. (onsite contractor at HP-Corvallis, OR)

Role: Program Manager **2002 – 2004**

- Managed team that developed manuals for inkjet production tools and processes.
- Assigned work and coached staff on how to best manage projects to exceed quality expectations of client.
- Developed manuals when staff workloads dictated.
- Performed employee evaluations.
- Ensured smooth execution of contract deliverables and documentation processes specified by HP management.

Role: Technical Writing Lead **2001 – 2002**

- Supervised six technical writers while maintaining writing duties.

CDI Corporation (onsite contractor at HP-Corvallis, OR)

Role: Technical Writer **1998 – 2001**

- Developed operating, maintenance and procedure manuals for tools and processes for inkjet manufacturing lines.

AccuFab, Corvallis, OR

Role: Technical Writer **1998**

- Developed operating and maintenance manuals for a robotics company.

Western Oregon University, Monmouth, OR

Role: Writer/Designer **1996 – 1998**

- Produced press releases and newsletters for public information office.

Gazette-Times, Corvallis, OR

Role: News Editor **1995-1996**

- Supervised four copy editors and four page production staffers. Edited stories and designed news pages.

Role: Copy Editor **1989-1995**

- Edited stories and designed news pages.

EDUCATION

B.A. in English and history, University of Rhode Island

Margaret McGrady

Help Desk Lead

PROFILE

Ms. McGrady has nearly two years of experience working in the Electus help desk environment. As part of her current role as Help Desk Team Trainer, she developed and implemented a training program that quickly provides new help desk team members with the required knowledge of the Electus application. The program also includes instruction on techniques of effective call handling. Prior to that, Ms. McGrady was a Help Desk Technician for the Maryland MDVOTERS implementation of Electus, working directly with end-users and the development team to resolve application issues in a timely manner. Ms. McGrady also has experience in quality assurance.

EXPERIENCE

Saber Corp.

Role: **Help Desk Trainer**
Period: **03/06 – Present**

In the role of Help Desk Trainer for all Electus voter registration projects, Ms. McGrady is responsible for the following:

- Designing and maintaining training program for new staff
- Creating and maintaining help desk process documentation
- Ensuring that help desk team members stay current in ongoing application changes

Role: **Help Desk Technician**
Period: **12/05 – 03/06**

As a Help Desk Technician for the Maryland voter registration system project (MDVOTERS), Ms. McGrady had the following responsibilities:

- Answered incoming calls from end-users and assisted them with problem resolution
- Created reports for Counties about the status of issues reported
- Created and tracked issues using an online tracking system (SPIRIT)
- Contacted clients on a regular basis about issue resolutions

Role: **Quality Assurance Technician**
Period: **07/05 – 12/05**

Ms. McGrady worked as a Quality Assurance Technician as part of the team that delivered the Iowa Statewide Voter Registration System. Her responsibilities included:

- Conducting testing for errors or inconsistencies
- Working with the development team to resolve application issues
- Maintaining a detailed written record of issues and resolutions in the SPIRIT online issue tracking system
- Providing Quality Assurance for the Electus application through Quality Control testing

EDUCATION

B.S., Psychology
Oregon State University, Corvallis, Oregon

A.A., Liberal Arts
Southwestern Oregon Community College, Coos Bay, Oregon

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