



Quest's Response to
RFI No. 16-04

Modernized Elections System for Washington State

December 23, 2015



December 22, 2015

Ms. Stephanie Goebel
RFI Coordinator
Project Manager
Stephanie.goebel@sos.wa.gov

RE: RFI No. 16-04 – Modernized Elections System for Washington State

Dear Ms. Goebel:

Quest Information Systems, Inc. (Quest) appreciates the opportunity to respond to the request for information provided by the State of Washington for a modernized elections system.

With over 17 years of experience developing and implementing election-related solutions in eight states, Quest is confident our team is the right partner to deliver this system to the Secretary of State.

Quest appreciates the opportunity to provide our qualifications and share our insights, expertise, and industry knowledge. We look forward to the opportunity to work with you.

Sincerely,

Steve M. McNear
President
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Phone/Fax: 317-806-8821

Response to RFI No. 16-04

1. *Exhibit B contains business requirements for the Washington State Modernized Elections System. (Note the scope of requirements excludes ballot creation and Tabulation.) Vendors are requested to validate and proof the business requirements to identify any requirements they believe have overlooked. Please provide a list of additional business requirements you recommend we consider for inclusion in a future RFP.*

Requirement 205 states “In the case that the WA State Legislature enacts automatic voter registration, system must generate an opt-out card to be sent to voters newly registering with an Enhanced Driver's License or a Commercial Driver's License. This feature must be suppressed unless policy is enacted.” However, there is no requirement listed that states that the system must support automatic voter registration for persons receiving an Enhanced Driver's License or a Commercial Driver's License. This would also require effort on the part of DOL in that they would need to proactively send information about persons receiving Enhanced Driver's Licenses or Commercial Driver's Licenses to the VR system rather than simply responding to calls from the VR system.

2. *Also pertaining to business requirements in Exhibit B, please identify any requirements you believe to be exotic. In other words, identify any requirements that you believe are uncommon, difficult to fulfill, or for any other reason contribute significant cost and/or time to the Modernized Elections System? Please identify which, if any, of the identified requirements are exotic and why.*

Since Washington is a vote-by-mail state, supporting Election Day Registration (requirement 140) may add additional cost and/or time. Business rules will need to be elaborated and implemented that will ensure that a voter who has been issued a ballot based on their registration at one address and then registers and votes on Election Day using a different address has only one ballot counted. This may have implications on how counties process ballots received to ensure that any ballot from a voter who registers on Election Day is not counted until such time as it is determined whether or not the voter has cast multiple ballots and if so, which is the valid ballot for that voter.

3. *Exhibit A contains the WA OCIO IT Security policies. Within Exhibit B, there is a worksheet titled “Critical Election Periods”. Washington State Elections Officials desire a solution that balances the provision of uninterrupted services during critical election periods with cost. Please provide a recommendation for high availability.*

Balancing the need for uninterrupted service during critical election periods and the cost of providing such services is a challenging undertaking. Solutions to mitigate the likelihood of a service interruption cover a wide spectrum of technologies that offer various degrees of protection against interruptions and can range in cost from a few thousand dollars to tens of thousands depending on the desired level of protection.

To determine the appropriate balance, organizations must first develop a disaster recovery or business continuity plan that documents and prioritizes essential business functions and the resources required to provide those functions. Further, one must determine how long the organization can tolerate operating without each of the business functions. This critical information establishes service interruption criteria and a basis for determining what resources are required to ensure the services can be provided in a manner that minimizes the likelihood of interruptions during normal operations and as a contingency to normal operations in the event of an extended service disruption.

In the absence of such a plan, Quest recommends a hosted solution with high availability to all state and local clients. There are several options for how the solution might be hosted, depending on the state’s preferences. Quest has a client hosting our Voter Registration and Election Management solution (FirstTuesday®) in a state datacenter, while another client has chosen to utilize a 3rd party world-class secure managed-hosting service; provided by our hosting partner. Quest has utilized this partner for more than 12 years providing hosting, backup and recovery for Quest’s FirstTuesday® solution. Under the combined management, there have been no unplanned or unexpected incidents resulting in the loss of solution availability to the end-user community in the 10 years since going live.

As a recommendation, the hosting provider should provide advanced infrastructure and managed service offerings that deliver the scale, security, and reliability necessary to meet the demanding requirements of mission-critical government solutions.

The suggested hosted model provides a number of benefits that may include:

- Allows the State to focus on the business of voter registration and managing elections rather than IT management
- 24/7 professionally managed infrastructure with multiple levels of redundancy, security and capacity
- The availability of multiple geographically-separated data centers to support disaster plans
- The ability to adjust system capacity based on election cycle needs
- Allows Washington to budget for low monthly operating expense rather than a large capital expense. Future capital outlays to replace obsolete equipment are built into the monthly fee plan.

The FirstTuesday® solution could be hosted at each individual county location. However, this may not result in increased availability and would almost certainly result in higher overall infrastructure costs.

It is worth noting that high-availability comes with a price and the relationship between availability and cost is not linear. The price of additional units of availability – one minute or hour – increases at an increasing rate. Those costs must be weighed with a pragmatic scale, which is to say, “How much downtime is tolerable? And, how much uptime can I afford?” Of course, in the business of running elections, the answer is, “Well, that depends...on when the downtime occurs.” 99.9% availability (or uptime) means that over the span of a year, there may be up to 8 hours of unplanned downtime. That may be adequate during non-election cycles but not if the system was unavailable for 8 hours the month preceding a Presidential Election. If the budget supports 99.99% uptime, there may be 52 minutes of downtime during the year. That level of availability may be acceptable and will certainly be substantially more affordable than 99.999% uptime which guarantees there will only be 5 minutes of unplanned downtime throughout the year.

To determine exact pricing at each level of availability, would require detailed information regarding the system configuration which is unavailable at this time. As a point of comparison, the Microsoft Azure cloud environment is built using multiple redundant servers and components architected with similar backup servers and components that can, if required, be located in separate geographic locations. The Azure environment is architected for high availability. Yet, even with Azure’s extraordinary levels of redundancy, Microsoft’s Application Service Level Agreements (SLAs) are limited to 99.95% according to their web site (https://azure.microsoft.com/en-us/support/legal/sla/app-service/v1_1/) – just under 4.5 hours per year.

4. *Exhibit A contains the WA OCIO IT Security policies. Within Exhibit B, there is a worksheet titled “Critical Election Periods”. Washington State Elections Officials desire a solution that balances the provision of uninterrupted services during critical election periods with cost. Please provide a recommendation for disaster recovery.*

Balancing the need for uninterrupted service during critical election periods and the cost of providing such services is a challenging undertaking. Solutions to mitigate the likelihood of a service interruption cover a wide spectrum of technologies that offer various degrees of protection against interruptions and can range in cost from a few thousand dollars to tens of thousands depending on the desired level of protection.

To determine the appropriate balance, organizations must first develop a disaster recovery or business continuity plan that documents and prioritizes essential business functions and the resources required to provide those functions. Further, one must determine the how long the organization can tolerate operating without each of the business functions. This critical information establishes service interruption criteria and a basis for determining what resources are required to ensure the services can be provided in a manner that minimizes the likelihood of interruptions during normal operations and as a contingency to normal operations in the event of an extended service disruption.

In the absence of such a plan, Quest can offer some general guidance. In addition to a production environment where Washington’s applications and database reside, Quest recommends maintaining a backup data center geographically separated from the production data center be used as a disaster recovery site. A copy of the solution software can be maintained at the site with the data replicated at regular intervals. In the event of a disaster, the secondary site can quickly be brought online and the system restored and made available to all users with little or no loss of data and minimal downtime.

The State’s IT group or the Solution provider will work with hosting site’s backup team to manage the software, hardware, and network infrastructure to design an appropriate back-up architecture. The provider should employ a systematic approach to ensure that the most current data is backed up and can be quickly restored.

Quest recommends the following requirements for a disaster recovery solution:

- Full back-ups capture all data on the system and data drives
- At a minimum, full backups should be performed every seven days while incremental backups are performed daily and log files every 5 minutes. This

captures any changes to the data since the last back-up, whether it was a full or incremental backup.

- Full system and content back-ups should be stored for 30 days. On-site with incremental back-up available offsite for a longer duration as required.
- Provide high performance back-up architecture ensuring minimal performance drains on your servers from the back-up process. A secure, back-end network is used to transfer data from disk to tape. By performing back-up through a back-end network, this ensures that end-user traffic is not impacted.

5. Please provide a recommendation for system integration approach and methodology, which most effectively supports the specified business requirements and other concerns mentioned in the Background and Objective section.

The appropriate system integration approach and methodology is dependent on and should be tailored for the particular architecture of the new system. We provide some guidance below based on a preliminary architectural recommendation. It is worth noting that, in all cases, Quest recommends the highly collaborative approach we take on our engagements. In those cases, we have found it most effective to apply the appropriate subject matter expertise to each problem set, conduct concurrent activities to shorten project duration and facilitate comprehensive consideration of all pertinent issues, and, finally, require the ongoing engagement of client end users, subject matter experts and decision makers. This approach has been shown to be a fundamental requirement for success.

An integration approach needs to take into account three major areas of concentration:

- Integration between OSOS & Counties;
- Integration of core components (VR, EMS, Ballot delivery, Web site, Online registration, Online filing, Online voters' guide, etc.);
- Integration of core to peripheral (Ballot creation systems, Tabulation systems) and third party (DOL, DOC, Courts, etc.) systems.

Quest's recommended approach to integration would be to implement a centralized system designed from the ground up which will be integrated with individual county voting equipment through appropriate data interchange. A highly customizable off-the-shelf solution eliminates most integration issues between OSOS and the Counties as well as issues of integrating the core components. Integration with peripheral and third party election systems would remain in place. Many peripheral and third

party election systems are already supported by off-the-shelf solutions. Quest's approach to those integrations would be to analyze each on a case by case basis. Quest would work with whoever maintains each system to understand the integration capabilities of that system. Quest would then design and implement an interface for each system appropriate to that systems capabilities and the needs of the OSOS & Counties to exchange data with that system.

6. *Please provide a recommendation for project management approach and methodology, which most effectively supports the specified business requirements, other concerns mentioned in the Background and Objective section and project values of transparency and collaboration amongst the state's 40 separately elected Elections Officials.*

The principles of transparency and collaboration are hallmarks of successful projects. In keeping with that philosophy, Quest recommends tailoring standard, best-practices project management approaches and methodologies to the unique requirements of each client project. The result – a solution that exactly meets the client's needs underwritten with industry best practices, a formula to ensure success.

Quest believes that a key factor in the successful management, execution and delivery of any project is strong, experienced leadership that consistently practices proven project management methodologies and techniques. To achieve a commitment to on-time, on-budget, on-quality execution of a project, the methodologies utilized should incorporate best practices into a practical, effective approach. Each process area should include a set of tools, templates, and best practice guidelines designed to assist in planning, monitoring and controlling all phases of the project life cycle.

Project Management Experience

To implement a large mission critical solution, a dedicated project management team should consist of specialized roles with prior experience in leading, managing and supporting Voter Registration and Election Management implementations. Quest recommends a Service Delivery Manager role for operational and communication responsibility, a certified PMP Project Manager to manage day to day team resources, deliverables and plans leveraging proven methodologies and dedicated Subject Matter Experts experienced in various VR & Election subject areas to minimize project risk and provide deliverable quality review.

Quest recommends a project management approach focusing on these key areas at a minimum:

Project Portal. Communication portal to facilitate communications with project participants and stakeholders. This portal will provide up-to-date access for all communications, reports, plan, deliverables and other project related documents.

Project Schedule. A project schedule and work breakdown structure of all tasks, duration, dependencies, milestones and deliverables. Any changes will be identified along with the cause for the change. Any schedule changes will be identified and a determination of any corrective action will be adjusted on a weekly basis.

Communications. Effective reporting through meetings and written reports is essential to project success. Maintaining effective communications with all stakeholders is a key component of project management. At a minimum, weekly status reports, project team meetings and executive reviews will be delivered. A formal project communication plan will be provided at the Initiation of the project.

Risk Management. The project team will continually identify principal risks to the project and manage them based on their likelihood of occurring and their potential impact on the project throughout the lifecycle of the project. Examples of risk categories would be: Staffing, Quality, and Schedule. A list will be maintained as appropriate.

Issue Management. The occurrence of issues during a project is inevitable, so the existence of a mechanism to manage these issues is essential. This procedure applies to all project issues/problems found. A list will be maintained with access for all project stakeholders to create, update and view.

Scope Management. Scope management is the single most important factor in enabling a project to be delivered on time and on budget. The scope of the project will be monitored over the life of the engagement. During the project, new features and functions not identified in the requirements will invariably be identified. Some of these features and functions may have no material impact on the project schedule or cost. Regardless of the impact, all changes to the project will be captured, documented, reviewed and approved.

Change Management. It is important for change management to be established early in the project life cycle. A recommended approach would be to develop a formal change management plan and use an automated tool to manage, track, and analyze change requests from the initial identification through final resolution.

Project Execution and Control. The project management team will continually monitor the team's activities to determine that project schedules are met and will update the project plan and schedule each week. The project management team will also detail the schedule of status meetings for the project team and progress meetings with the identified stakeholder groups. Status reporting is essential to managing successful projects; a formal timeline and a detailed schedule for reporting status in accordance with the project requirements and schedules will be developed.

Deliverable Review and Acceptance. Acceptance is a formal process achieved by frequent reviews and approval of documentation and products delivered over the life of the project. For each deliverable and project phase, the project management team will solicit acceptance from the OSOS. Project Acceptance processes will be aligned with any contractual acceptance conditions.

7. Please provide a recommendation for funding approach and cost distribution, which most effectively supports the specified business requirements, other concerns mentioned in the Background and Objective section and project values of transparency and collaboration amongst the state's 40 separately elected Elections Officials. Please include citations of the recommended approach in place throughout state and local governments.

Quest is not aware of a universally applicable funding model that can be cited. However, there are a number of options and issues to consider. Many find it attractive to pursue an approach in which the cost of capital investment and ongoing management of system infrastructure is outsourced for an affordable monthly operating expense. Such an approach may allow procurement without major legislative initiatives, avoid political challenges and make it easier to keep pace with technological advances. On the other hand, some may question whether the State might do it more cheaply in house.

Given Washington's specific situation, we suggest you consider the following:

- Given all governance and budgeting considerations, which model represents the highest likelihood of succeeding – central, statewide or distributed state-county funding? Is the answer different for one-time capital investments versus ongoing operating expense budgets? [A single, centralized system will likely have a lower overall cost but distributed funding may be more feasible. System performance, reliability and uptime requirements must also be considered.]

- Do the State and counties have a history of successful cooperative and collaborative financing partnerships?
- Is it relatively simple and understandable to assign system capabilities and costs to the State and individual counties? If so, a distributed funding model may be feasible. If not, distributed funding will probably be untenable or, at least, highly complicated.
- When balancing the pros and cons of one-time capital investments vs. ongoing operating expenses, will the State's financial philosophy support incurring higher overall long-term costs for the benefits of low monthly operating costs and the flexibility to switch or change the system architecture or configuration?
- If Washington pursues a distributed funding model, what happens when one or more counties are unable to meet their financial obligations? If there is a contingency plan, how will that be fair to other counties?

Depending on the actual implementation costs for the selected vendor, the state may consider paying for the implementation, but working with the counties to contribute to the ongoing maintenance and support costs. The maintenance and support costs among the counties to support the current VR/EMS systems in use is likely more than would be needed to cover the expense of a centralized solution. A pro rata formula to share maintenance and support costs based on registered voters might be a good proxy for county size/budget. The counties would likely still realize overall savings versus their current spend.

8. *Please provide a recommendation for data conversion and migration, which most effectively supports the specified business requirements, other concerns mentioned in the Background and Objective section and project values of transparency and collaboration amongst the state's 40 separately elected Elections Officials.*

The recommended approach for data conversion will be flexible, efficient, and accurate. Data conversion and migration must be considered early in the Initiation and Planning phases of the project.

The data conversion will run in parallel with the project's system development. Beginning this process early in the project will help minimize risk. Early detection of data issues that require modifications to the target database table structure will allow those changes to be addressed when they will be least disruptive to the project's cost and schedule. Also, as data is successfully converted, it will provide meaningful test data for the system.

The first step in the migration process will be to gather any and all information available about the current database structure including database diagrams, table layouts, image formats, etc. The next step is to obtain an extract of all legacy data for conversion in an industry-standard format. This raw data will be imported into an intermediate “staging” database.

Database Analysts will analyze the data and identify any data anomalies that will require “data cleansing”. The primary goal of a data cleansing effort is to eliminate data inconsistencies, invalid values, and other shortcomings in data integrity from the legacy databases. This will greatly facilitate converting the existing data to the format required for the target system. Also during this phase, the data analysts will identify any data items that are in the legacy database that are not included in the target database and any data items in the target database that have no corresponding data item in the legacy database. Data analysts will work with OSOS personnel to determine the most effective methods to cleanse existing data and resolve discrepancies between legacy data and target data items.

Data Analysts will then develop and test processes that will cleanse, convert and transform the data from the legacy staging database tables to cleansed staging database tables. Both current state and cleansed state data will be in the staging database, allowing for clear before and after representations of the data. The data items in the cleansed staging database will be mapped to data items in the new database and transformation routines will be written and tested to move the data. One particular challenge of the data migration process is that the target database is usually a “moving target” during the software design and development phase. To mitigate this risk, the mapping from staging to the final database is not finalized until the design process is completed. During the development phase there will be close communication between the development and data conversion teams to adjust to any data structure changes. Validation methods will be employed to verify the accuracy of the data after conversion. Converted data will be available in the databases used for system testing and user acceptance testing as a further means of validating the data conversion.

Each official data migration run will follow a basic process. The cycle will begin with extracting data from the legacy database. Next, the data migration team will import this data into the staging database, cleanse and transform the data within the staging database, then move the data to the final database. Data that does not conform to expected standards will be recorded in error files. Validation queries and error reports will be reviewed by all parties.

9. *Please provide a recommendation for user experience design approach and methodology, which most effectively supports the specified business requirements, maximum stakeholder usability and adoption and project values of transparency and collaboration amongst the state's 40 separately elected Elections Officials.*

Most HAVA-era statewide voter roll management systems were designed using traditional software development methodologies which may be characterized as “inside-out design”. The requirements of election officials and end users were considered from a functional perspective and screen layouts were made “user friendly”. However, end user needs were only given superficial consideration. Is the screen appealing and usable based on layout, fonts and colors? Does the screen layout support effective use of the software and efficient navigation on each screen as well as from screen to screen? Still, software design principles focused on system performance, efficient use of resources and how the system was to be used – transactional vs. data analysis. How should the data be organized for appropriate storage, retrieval and presentation? Software was architected to be easier to maintain and evolve by separating functions into layers – the data layer, the business rules and the user interface.

Preferred software design methods use an “outside-in design” approach. Primary consideration is given to how individuals that use the software seek information; how end user workflows are impacted by and how do they impact the access and use of information; and, how end users consume information. With the proliferation of desktop computers, the internet, tablets and smartphones, software is ubiquitous and the general population is, not only familiar with computers and interactive, responsive software, they expect it whenever they seek information and perform their jobs. User interfaces must be designed with contextual intelligence and adapt to users’ needs and abilities. Software is ubiquitous. Hardware can be viewed as being unlimited. Database designs, screen layouts and software architecture must adapt and serve the usability requirements of end users. We have advanced beyond the period when users must adapt to software requirements.

Quest uses and recommends an “outside-in” User Interface/Usability (UI/UX) design approach that begins and ends with users.

- Gain an understanding of business goals, process history and future needs
- Identify business process workflows

- Interview representative end users to learn how they seek information, how information supports and is integrated into their workflow and how they consume the information
- Design process workflows and then screens based on the above as well as human factors research, contextual intelligence, process effectiveness and efficiency
- Develop workflow and screen mockups to review with key stakeholders
- Refine and revise UI/UX design based on feedback from actual users of the system
- Involve UI/UX design specialists with the software design team to ensure the outside design and the inside design serve end users

Quest would welcome the opportunity to present our FirstTuesday® UI/UX design approach and share recent examples of successful implementation of an “outside-in” design.

FirstTuesday® was initially designed for HAVA based on statewide user collaboration with Quest employees, many of whom were former county level election officials. Modules have been enhanced over time based on end user feedback; an outside in design approach. Data input layout and workflows are designed to maximize end user productivity and interaction with the product.

10. Please provide a recommendation for system support, including service and maintenance, service level agreements and helpdesk, which most effectively supports the specified business requirements, other concerns mentioned in the Background and Objective section and project values of transparency and collaboration amongst the state’s 40 separately elected Elections Officials.

Quest typically provides post-implementation warranty for new FirstTuesday® installations. FirstTuesday® is warranted to operate according to product documentation and enhancement specifications. Deviations from specifications, also known as defects, are corrected under Quest’s standard support agreement at no additional charge. Quest support agreement offers unlimited support, i.e. not limited to a set number of hours per month. Quest provides a full-complement of software support services including Help Desk (Tier1), answering end user questions, logging trouble tickets, sending acknowledgments, escalating issues, Tier 2 and 3 support and all hosted IT infrastructure management.

Maintenance and Support

Quest recommends maintenance services to complement the Tier 2 and 3 support services described below. In addition to correcting defects and other regular software maintenance tasks, maintenance covers upgrading FirstTuesday® to remain current within 2 releases of Microsoft environmental software as well as periodic software improvements, database house-keeping and technology-specific enhancements.

Tier 1 Support

Help Desk Services will provide end-user (Tier I) support for all calls. Should support personnel not be immediately available, the caller will leave a voicemail for follow-up as soon as a Help Desk specialist becomes available.

When the Tier 1 Help Desk support technician cannot resolve a problem or it is determined there is a “bug” in the application or the issue resolution is beyond the expertise of the Quest specialist, it will be immediately escalated to the Tier II support personnel for further analysis.

The Tier I Help Desk handles all incoming support calls from any authorized user concerning the application software.

Tier 2 Support

The Tier 2 Help Desk support staff will have knowledge of the system architecture and design, as well as the technologies and tools used to develop the application, and, most important, business domain knowledge to determine in what ways end user work is affected by a reported problem.

The Tier 2 Help Desk is responsible for problem triage for application-related issues.

Tier 3 Support

Tier 3 support provides software-level technical support and problem resolution. Tier 3 support may be provided by multiple staff members whose aggregate skill set include software developer-level knowledge of FirstTuesday® and the Washington instance of the application.

- Tier 3 support staff will include members with detailed knowledge of FirstTuesday® operations of the licensed software program and will apply this knowledge to answer questions escalated by Tier 2 support.
- Tier 3 support includes creation of software updates to correct FirstTuesday® defects.
- Tier 3 support includes deployment of updates to a FirstTuesday® test environment, training and production environments.

- Quest will update and releases to the production environment via remote access.
- Quest will provide staff to facilitate the management oversight and reporting required to support the system. This includes regular communication with the Washington Secretary of State's office and personnel supporting the system.

Help Desk

Quest uses Support works Service Desk Software version 7.4.1 from Hornbill Systems to track incoming help desk calls and Interaction Call Center software, developed by Interactive Intelligence, to support customer service through the Quest Help Desk. All incoming calls are tracked and tickets are opened for each issue. Monthly reports containing summary detail only or detailed ticket information can be produced depending on the needs of the client.

11. Please provide a recommendation for contract vehicles and strategies in support of your recommended approach to system support and system integration.

Contracting with a single vendor (or few vendors) will lower the State's cost to administer the contract, reduce contract management complexity and increase accountability. Quest recommends a single contract with the state to provide all of the services to the state and counties, with appropriate service level agreements to ensure that counties large and small receive consistent services and response. The State and counties should enter into agreements or memoranda of understanding, especially in a shared or distributed funding model. Any services or solutions outside of the Quest suite will be subcontracted through Quest, which will be solely responsible to the state and counties for the services and solutions that comprise the Voter Registration and Elections Management system.

12. Please provide a recommendation for testing, complete through final acceptance testing and to include mock election.

Development and implementation of a Voter Registration and Elections Management system will require a thorough testing strategy. System quality is dependent on dedicated and engaged testing on the part of the Washington Elections stakeholders as well as the solution provider. A coordinated Testing Plan should be developed during the Initiation Phase of the project.

Quest uses multiple environments to develop, test, and deploy its solutions. Since each environment contains a separate copy of all applications, websites, and databases, this approach minimizes problems associated with shared resources. This approach can also lend itself to development and testing simultaneously which shortens the development time and improves productivity.

The development environment gives developers access to change any code, file systems, and databases associated with that environment. Developers are required to create and follow a detailed test plan for any change introduced. Once tested, the associated changes are reviewed by a senior-level developer to find any errors, standards violations, or problems with the implementation. When the changes have been approved they are migrated to the testing environment.

In the testing environment, each change is tested by Quest staff based on the test plan for the change. Since the environments are self-contained, test data remains isolated, preventing data conflicts from other environments (including development). If any part of a test fails, the results are documented and sent back to the developer to make the appropriate changes. Once the Quality Assurance analysts approve the item, the changes are then passed to the client for user acceptance testing. Any change in the testing environment that has been fully tested can be chosen for a production release, at which time the changes are migrated to the staging environment.

The staging environment is configured to resemble the production environment as closely as possible, and is used for pre-production and deployment testing. Any changes that have completed testing can be selected and compiled into a production release. Each release is initially deployed to the staging environment to diagnose any problems with the application or the deployment process itself. After a release is successfully deployed and tested in the staging environment, it can be moved to the production environment.

As part of Quest's recommended testing approach, a testing plan will be developed to include the following key areas.

Unit Testing and Unit Test Plans

As part of the development process, developers perform unit testing to ensure proper coding and that desired functionality is achieved. This testing is performed in the development environment. As the first step in developing a "unit," a test plan is developed which includes the test cases and applicable test scripts for that unit. Once the unit is developed, the approved test cases will be executed to identify and correct any bugs. Developers will repeat the test cycle until the "unit" is free of all bugs.

Security Testing

During the design phase, security-based requirements will be defined. A matrix will be developed of user groups and accessible data elements for those groups. These role-based security requirements will be incorporated into the system. This will ensure that only authenticated users have access to authorized information.

During the development phase, security standards set by the client for application development will be followed. Common security issues such as SQL injection, session hijacking, etc. will be identified and addressed at early stages of the project. As part of a “white box” security assessment, security auditing and code reviews will be conducted by the technical lead to ensure that security standards are incorporated in the application. The testing team will perform the black box security assessment in the QA environment to help detect security issues that arise as a result of change in the underlying environment.

Load/Stress testing

With the ever-expanding number of internet ready smartphones and tablets, traffic to the sites may grow substantially over the coming years. Commitment to developing applications that will scale to increasing traffic is a must. In addition, we will work with the client to identify any applications that are expected to experience heavy traffic and require high availability. Quest recommends to *stress test* these applications using the most realistic methods possible. Methods may include 3rd party load tests, Microsoft Azure/Amazon AWS load tests and custom written load testing applications. Bottlenecks will be identified during this testing. Application architecture may be adjusted in order to increase the throughput of the bottleneck to a level deemed acceptable.

User Acceptance Testing (UAT)

User Acceptance Testing is an important testing component. The approach to UAT involves:

- Getting key UAT users involved early
- Developing a traceability matrix between requirements documents and test cases
- Providing training of the system to UAT participants
- relying on use cases as the basis for creating test scenarios
- Allowing users to write test plans
- Migrating data prior to the test
- Creating the test cases that mirror daily job functions of the users
- Providing users adequate time to execute the test

- Performing UAT in an off-site training environment, away from daily work interruptions

The UAT phase will be an opportunity for the client to determine if the solution matches the agreed-to design. User acceptance test plans will be developed based on the business requirements. Test cases will be created that mirror real-life scenarios defined by the project staff. These test cases will be mapped to the requirements and will provide exact steps for users to perform. Because the acceptance test will be in a use case format and mirror real-world examples by the client staff, the test scenarios will be helpful in conducting user training.

Mock Election Testing

The purpose of this testing is to support the additional review of all previously defined business processes and system functions in a simulated election scenario prior to the implementation of the new system. This will increase awareness, confidence and acceptance of the new solution.

Quest recommends the planning, development of scenarios and materials, setup of the environment, and administration of such an advanced exercise requires detailed work performed by a dedicated group of State, County and solution provider staff. County and State staff will assist in the development, preparation setup, training and participation in the execution of the mock election itself.

The Mock Election planning effort will roll into a subsequent Mock Election plan deliverable entailing the scenarios and schedule to use for the participating counties. The following overview details the major phases required to successfully execute a Mock Election.

- **Kickoff.** Commence the project by establishing the Mock Election Advisory County and project organization, project and communication plans, and roles/responsibilities.
- **Process Development.** Develop/finalize the Mock Election Document Templates and Playbooks. Develop the Mock Election execution plan and County Communication procedures.
- **Pre-Election Preparation.** Establish the system for testing, develop Mock Election supporting documentation and validate the documentation and Mock Election plan through a Mock Election walk-through.
- **Training.** Train County Mock Election Team Leaders documentation/reporting requirements, the Game Plan and Individual daily play books for Mock Election Execution.
- **Execution.** Execute the Mock Election and compilation of issues/results

- **Acceptance.** Identify and implement refinements to the system

Based on prior experience, a minimum of 10 weeks is recommended for the Mock Election Testing cycle.

13. Please provide a recommendation for training. Elections Administrators and Staff around the state possess an intimate familiarity with their existing systems. We will require a training plan that enables county and state users to develop a high degree of comfort with the replacement system(s) in advance of go-live in order to support a seamless implementation for all Washington State elections stakeholders. Training to include internal users and administrators/IT support staff.

An education and training philosophy is critical to ensure that key personnel are proficient in their respective applications. Quest's recommended approach helps provide:

- Deeper in-house expertise, confidence, and satisfaction for key personnel;
- Integration between the configuration/development effort, testing, and roll-out;
- Improved job effectiveness in the broader user community, based on training from and interaction with familiar (State) personnel.

Quest provides several types of training for election-related solutions, described below.

Onsite Training (key State users)

An onsite training session of up to 5 days is typically desirable prior to roll-out of the new system into production. Onsite training days are up to 8 hours per day and include travel time and time spent in the actual training. These are conducted by personnel who are subject-matter experts.

Onsite training is valuable:

- Users are familiar with their own surroundings;
- Actual situations are utilized during training;
- Concentrated time can be spent in a short duration, prior to event such as go-live;
- Additional questions are always generated during onsite visits;
- Provides realistic insights by observing how users interact with the application in live situations.

Tools used in Onsite Training:

- User-testing instance of the system, with test data
- PowerPoint documentation
- Step-by-Step documentation
- Online Help

Web-Based Training

Web training is structured around specific activities related to the application. A ‘Question and Answer’ period is provided at the end of each training session. Sessions are typically 1-3 hours. This allows participation from all users with minimal office disruption or travel expense.

Delivering training in this manner serves as an outstanding refresher course during a very busy election cycle. A sample 2014 Web Training Schedule is provided below.

2014 SVRS Web Training Sessions
Additional Web Training sessions can be added upon request.

Month	Training Topic	Date
MARCH	March Build Overview	<ul style="list-style-type: none"> • 03/XX/2014 (10:00-11:30am EST) • 03/XX/2014 (1:00-2:30pm EST)
	Web Service Overview	<ul style="list-style-type: none"> • 03/XX/2014 (10:00-11:30am EST) • 03/XX/2014 (1:00-2:30pm EST)
	Absentee Overview	<ul style="list-style-type: none"> • 03/XX/2014 (10:00-11:30am EST) • 03/XX/2014 (1:00-2:30pm EST)
APRIL	Election Prep	<ul style="list-style-type: none"> • 04/XX/2014 (10:00-11:30am EST) • 04/XX/2014 (1:00-2:30pm EST)
	Certificate of Error Processing	<ul style="list-style-type: none"> • 04/XX/2014 (10:00-11:30am EST) • 04/XX/2014 (1:00-2:30pm EST)
	Election Night Reporting	<ul style="list-style-type: none"> • 04/XX/2014 (10:00-11:30am EST) • 04/XX/2014 (1:00-2:30pm EST)
MAY	Post Election Processing	<ul style="list-style-type: none"> • 05/XX/2014 (10:00-11:30am EST) • 05/XX/2014 (1:00-2:30pm EST)
JULY	Reprecincting Overview	<ul style="list-style-type: none"> • 07/XX/2014 (10:00-11:30am EST) • 07/XX/2014 (1:00-2:30pm EST)
AUGUST	August Build Overview	<ul style="list-style-type: none"> • 08/XX/2014 (10:00-11:30am EST) • 08/XX/2014 (1:00-2:30pm EST)
SEPTEMBER	Absentee Overview	<ul style="list-style-type: none"> • 09/XX/2014 (10:00-11:30am EST) • 09/XX/2014 (1:00-2:30pm EST)
	Election Prep	<ul style="list-style-type: none"> • 09/XX/2014 (10:00-11:30am EST) • 09/XX/2014 (1:00-2:30pm EST)
OCTOBER	Certificate of Error Processing	<ul style="list-style-type: none"> • 10/XX/2014 (10:00-11:30am EST) • 10/XX/2014 (1:00-2:30pm EST)
	Election Night Reporting	<ul style="list-style-type: none"> • 10/XX/2014 (10:00-11:30am EST) • 10/XX/2014 (1:00-2:30pm EST)
NOVEMBER	Post Election Processing	<ul style="list-style-type: none"> • 11/XX/2014 (10:00-11:30am EST) • 11/XX/2014 (1:00-2:30pm EST)
DECEMBER	Auto-Cancel Processing	<ul style="list-style-type: none"> • 12/XX/2014 (10:00-11:30am EST) • 12/XX/2014 (1:00-2:30pm EST)

On-demand Training

Video training modules covering the various business process of the Voter Registration and Election Management solution. This includes pre-recorded web training as well as modules produced specifically for a given topic or user group.

Step-by-Step Documentation

In addition to training, Step-by-Step documentation that outlines specific tasks that can also be used during web training sessions and onsite training is provided. Step-by-Step documents are maintained as functionality is modified.

14. Please provide a recommendation for documentation, including internal, external, and administrator.

Quest recommends the following documentation for the successful implementation of the Washington Elections solution. Internal documentation is defined as documentation for the project team, including both WA and Quest personnel. The external documentation is documentation for system users, including state and county employees, candidates, and the general public. Administrative documentation is defined as technical documentation about the system that it is intended for state and county system administrators.

Internal Documentation:

Internal documentation would include all the project documentation discussed previously in question #6. Project planning documents including the project charter, project plan, project schedule, communications management plan, risk management plan, issue management plan, scope management plan, etc. It would also include status reports, meeting agendas, meeting minutes and all other project related documentation. The purpose of this documentation is to assist in the planning, execution and recording how the system was put into production include documenting how decisions regarding scope were made and how any issues encountered were resolved or potentially deferred. System acceptance and post implementation documentation would include turnover documents, support procedures, defect tracking and future deployment schedules.

Internal documentation would also include requirements and design documents detailing what the system needs to do (requirements) and how the system meets those needs (design). Requirements documentation would include not only what the system needs to do internally, but what data needs to be exchanged with other systems

and what the specific needs of those data exchanges entail. Design documentation would include user interface design documents, database designs, and technical design documents. Some technical design documents may remain internal to Quest as they may contain proprietary information. All testing documentation utilized by software engineers, user acceptance testing scripts, performance and security tests and mock election related documentation would also be included.

System documentation would be included to document the architecture, security and performance capabilities of the system. This documentation includes logical and physical layouts of the architecture, installation and configuration guides, disaster recovery plans and security performance.

Data conversion documentation including data mapping documents, data transformation specifications, and results of testing and production data migration would also be included in the internal documentation. This will serve to detail how data from legacy systems was brought into the new system including any changes necessary due to differing data formats in the legacy systems and between the legacy systems and the new system.

External Documentation:

External documentation would include on-line help documentation, step-by-step documents, troubleshooting guides, user manuals and any training documentation put together as part of training users on the system. While the audience for this documentation will be users of the system, it is recognized that those users include daily users of the system and infrequent users. Documentation of public facing portions of the system will be tailored towards an audience not necessarily familiar with the systems or underlying laws and regulations. If required, public facing documentation can be professionally translated into those languages that need to be supported by election officials in Washington.

Included in external documentation would be general overviews of the system and system components. These would be created with the purpose of explaining the system to elected officials, the press, academics, and the general public.

External documentation would also include data dictionaries for publicly accessible data. These data dictionaries would include field definitions of the publicly available data, specifications of the data currency of various data sets, and descriptions of how to access the data.

Administrative Documentation:

Administrative documentation would include system admin guides, data dictionaries, build and hotfix logs, troubleshooting guides, knowledge base, etc. The purpose of these documents is to allow system administrators at the state and county level to manage the system under normal circumstances and to determine what actions need to take place under abnormal circumstances.

15. Please provide a recommendation of voter outreach requirements for the Modernized Elections System.

Historically, election officials and citizens have been repeatedly confronted with shamefully low voter turnout which is attributed to lack of civic engagement, unexciting races, lack of meaningful linkages to individual voters and lackluster candidates. We wring our hands, note the statistics and, with a feeling of helplessness, move on. Politicians and election officials offer the same product in the same form each year and, somehow, expect voters to magically begin to behave differently; to gain civic consciousness and turnout at the polls for the next election. Various techniques are applied to “make it easier to voter” – early voting, vote centers and satellite voting, mail-in ballots; all good ideas and necessary changes. In some cases, turnout improves but the world’s number one democracy still lags other democracies in voter turnout statistics by as much as 45-percentage points.

Proactive voter outreach shifts the responsibility for increasing turnout from the voter to election officials. Election officials cannot passively hope voters will turnout for elections. Rather, election officials must actively reach out to voters on a regular basis to inform them, invite them to interact with the election community, encourage voter engagement through regular two-way communications and programs that give them a way to participate. Marketers and psychologists long ago learned that, if you ignore potential buyers, they remain isolated, under served and ignorant of the opportunities before them. If, on the other hand, you reach out and provide them with ways to interact and get involved, they’ll become loyal patrons. The same is true of voters.

We are pleased to share a brief overview of Quest’s Voter Outreach Turnout and Engagement (VOTE) solution abstract.

Abstract

VOTE Goals and Benefits

Goals:

- Increase voter turnout & involvement in elections
- Engage voters in ongoing interactions

Benefits:

- Satisfy Election Officials' duty to communicate with voters
- Utilizes active vs. passive voter communication
- Lower cost than print communications
- Regular, direct communications tailored to voter
- Voter interaction feedback – received, read, click-thru
- Audit trail for voter interaction management
- Encourage voter involvement & turnout via reminders
- Leverage media most used by today's voters
- Solicit poll workers & communicate civic duties

VOTE – What is it?

VOTE is a systematic approach to establish two-way communication between individual voters and election officials in order to drive voter engagement and, ultimately, increase voter turnout. VOTE – Voter Outreach, Turnout and Engagement uses 21st century technology driven communication methods to reach individual voters, welcome their interaction, encourage ongoing voter engagement and, as a result, increase voter turnout. VOTE postulates a simple social equation:

Outreach → Interaction → Engagement → Turnout

In other words, the simple premise of VOTE is that regular Outreach invites Interaction which encourages Engagement and drives voter Turnout.

Within the VOTE system, election officials define voter outreach communications, develop message content, and establish communication schedules and frequency. Election officials can view voter interactions, produce reports and perform statistical analyses of interactions.

Through the state's voter portal, voters register to participate in VOTE, provide personal information in their individual myVOTE profile and select communication

preferences for media and message types. Voters can review messages received from VOTE, examine their vote history and describe their election engagements such as volunteering to work at the polls or plans to attend a debate.

VOTE communications may include some of the following:

- Voter communication via email, text & social media
- Encourage voter interaction, feedback, ideas, dialog
- Support regularly scheduled & on-demand automated communications w/ voters
- Support communication to different audiences – all voters, individual voters, eligible for an election, poll workers, candidates
- Communications tailored to voter based on district/precinct, candidates, etc.
- Track voter interactions – received, read, click-thru
- Complete audit trail of voter email interactions
- Provide statistical & analytical management reports

Quest welcomes the opportunity to further explore voter outreach concepts with WA.

16. Please provide a timeline estimate for implementation of your envisioned solution in response to business requirements in Exhibit B and your response to items 1-15 above.

Quest's FirstTuesday® Voter Registration solution is a comprehensive, mature, HAVA-compliant system that has been continually enhanced for 10 years. This gives FirstTuesday® broad applicability and ease of implementation in most situations. Largely, the core FirstTuesday® functionality will satisfy most requirements with the remainder being easily configured or in some cases customized to exactly meet Washington's specific needs.

Quest's approach typical spans a 12-18 month timeline organized into the following high-level list of activities and timeframes:

- Project Initiation and Planning – ensure goals are well understood, participants have common expectations, project plan accommodates Washington election schedule.
- Gap Analysis and Design – ensure requirements are clearly understood, gaps between Washington requirements and FirstTuesday® are documented with solutions agreed, establish concurrence from participants that project scope is

clearly identified, familiarize Quest SME's with Washington election laws and processes.

- Project Plan – finalize based on election schedule and gap analysis, agree on plan, publish, finalize independent plan components – data conversion, training, acceptance testing, deployment.
- Implementation – customize and configure FirstTuesday® as required including all interfaces.
- Data Conversion – develop scripts and routines to prep data, validate data transformations, conduct multiple conversion iterations to confirm completeness and accuracy, convert data, validation and approval from the OSOS.
- Training – tailor training materials for the OSOS and county needs, pilot training, revise training as required, conduct training in phases.
- Mock Election – prior to Go-Live; simulated election cycle testing involving a sub-set of the overall user base.
- Deployment – plan and coordinate cutover, final data conversion, deploy FirstTuesday® as modified to exactly meet Washington needs.
- Warranty, Maintenance and Support – ensure application is performing to expectations and support of end-user community.

17. Please provide a cost estimate for implementation of your envisioned solution in response to business requirements in Exhibit B and your responses to items 1-16 above.

Per Amendment 4, it was noted vendors may chose non-response to item 17. Washington Election Offices are supportive of vendors' decision of non-response to item 17.

Quest declines to respond to this question at this time.