Response to

Request for Offer 13-409.00-007 Modernized Appliance Efficiency Database System (MAEDBS)

Prepared and Submitted by

TRINITY TECHNOLOGY GROUP

and

C&G Technology Services, Inc.

April 9, 2014, 12:00 noon

1. Cover Letter

Offer Submission Date April 9, 2014

Kate Spiess
California Energy Commission
1516 9th Street MS-7
Sacramento, CA 95814-5512
(916) 651-6588

Response to 13-409.00-007 Modernized Appliance Efficiency Database System (MAEDBS)

Dear Ms. Spiess,

I am pleased to submit this proposal on behalf of Trinity Technology Group, Inc. (TrinityTG), in partnership with C&G Technology Services (C&G) to provide services in response to the Modernized Appliance Efficiency Database System (MAEDBS).

We commit to fulfilling all requirements of the RFO. We have carefully reviewed the RFO to understand the scope, depth, and burden of all responsibilities. Based on this understanding, we have proposed available consultants with the needed experience and skills to fulfill the requirements of all services and provide all deliverables as described in the RFO. We have included C&G as a subcontractor for a portion of the work, but TrinityTG is the prime contractor and remains ultimately responsible for delivering the proposed services. We have worked with C&G on a professional basis for over six years during which time we have established a strategic relationship of trust and cooperation to seamlessly serve our clients, rather than just a marriage of convenience.

Trinity Technology Group is a Certified Small Business (Ref 20557) through the California Department of General Services. C&G is a Certified Small Business and a Certified Disabled Veteran Business Enterprise (DVBE) (Ref 47514) through the California Department of General Services whose resource makes up 22% of this bid for tasks that include requirements analysis, database design and conversion. Our IT-MSA Number is 5137002-130. We agree to the State model contract terms and conditions. I am authorized to bind our firm contractually.

Sincerely,

Randall Duart
Partner
rduart@trinitytg.com
916-761-2349

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3. Executive Summary

Trinity Technology Group, Inc. (TrinityTG), in partnership with C&G Technology Services (C&G), is pleased to submit an offer to the California Energy Commission for development of the Modernized Appliance Efficiency Database System (MAEDBS). TrinityTG's experience with delivering custom-built customer facing web applications, coupled with C&G's delivery experience and domain expertise with the Energy Commission, provides a unique combination of skills that will help us deliver maximum value to the Energy Commission.

In this executive summary, we present proposal content highlights, a summary of our firms' and staff resources' collective experience, and some key aspects of our delivery approach that set our offer apart and demonstrate our commitment to providing maximum value to the Energy Commission.

Content Highlights

This offer is structured to include the following information:

- **Overview of Required Tasks and Outcomes** – in this section of the proposal, we present a high level overview of the functionality for the new web-based application, with particular emphasis on the user experience and overall design approach. We provide examples of previous systems with similar functionality to provide context for the design approach, as well as demonstrate our collective experience with delivering such solutions.
- **Work Plan Highlights** – in this section of the proposal we provide a high level summary of the project schedule outlined in Section 7. Each phase of the project is summarized in a table and describes the timeframe, tasks to be completed during that phase, and key dependences on prior phase work (if any).
- **Deliverable Outlines** – in this section of the proposal we provide detailed descriptions of the proposed content and approach for completing the project's written deliverables outlined in this RFO.
- **Project Schedule** – we have included a printout of the expected tasks and subtasks, along with dependencies, estimated staff, and timeframes for each task.
- **Response to Requirements** – this section contains our response to the mandatory requirements, and includes narratives specifically tailored to the Mandatory Scored requirements, where we describe our approach to meeting those requirements.
- **Organization Chart** – the organization chart shows how the proposed team will be structured, as well as what the major threads of activity will be for the duration of the project. A staffing matrix that shows the collective years of experience each of the key staff has with the scored staffing requirements is also provided in this section, along with the resumes.

About the TrinityTG/C&G Team

TrinityTG and C&G bring complementary skillsets together in a successful partnership that has spanned multiple projects over the last four years. Past and current engagements include:

- **Department of Health Care Services** – Ongoing Maintenance of the Capitated Management (CapMan) system (2011-2013)
- **Department of Health Care Services** – Legacy Application Migration (2011-2012)
- **Department of Community Services and Development** – Development/ Implementation the Combined Output Reporting Engine (CORE) system – (2012-2013)
- **Department of Business Oversight** – Development/Implementation of the DOCQNET Enterprise Licensing System (2013 – Present)

Proven Team Members

The TrinityTG/C&G consists of several strong key staff members, including:

- **Amit Rai** – a PMP-certified Project Lead with significant technical experience, both large and small scale.
- **Greg Harvey** – an experienced SQL Server DBA and data architect who will help with the design and development of a scalable data model.
- **Sverre Schiotz** – an experience technical consultant with well over a decade of experience working with the Energy Commission.
- **Hemal Mehta** – an experienced .Net web development resource who has implemented multiple asp.NET web applications for the State of California, and has used a multitude of toolsets.

As part of our delivery approach, we have also included several functional resources who will assist during key phases of the project. Though not required by the RFO, we believe their skill sets and experience will be a valuable addition to the team:

- **Jessica Hovdesven** – a senior business analyst with experience in assessing complex business rules
- **Athina Addison** – an experienced QA/Testing resource who will provide a structured and detail-oriented approach to testing

Experience with the Appliance Efficiency Program

As noted above, our key staff includes Sverre Schiotz, an experienced technical resource with 20 years of experience at the Energy Commission. Having built many of the original database, Mr. Schiotz has unique knowledge that makes him an ideal candidate in supporting the team's efforts to understand the legacy systems, devise the correct business logic, and convert data from the legacy systems into MAEDBS.

Experience with Similar Solutions

Included in our references are three custom developed .NET systems, all of which includes features that will be similar to what is required for the MAEDBS. Examples include:

- Secure, public-facing registration and account management
- Wizard-based data input
- Bulk data import and validation
- Automation of complex calculation formulas
- Review/Approval Workflow
- Reporting capabilities
- Administration

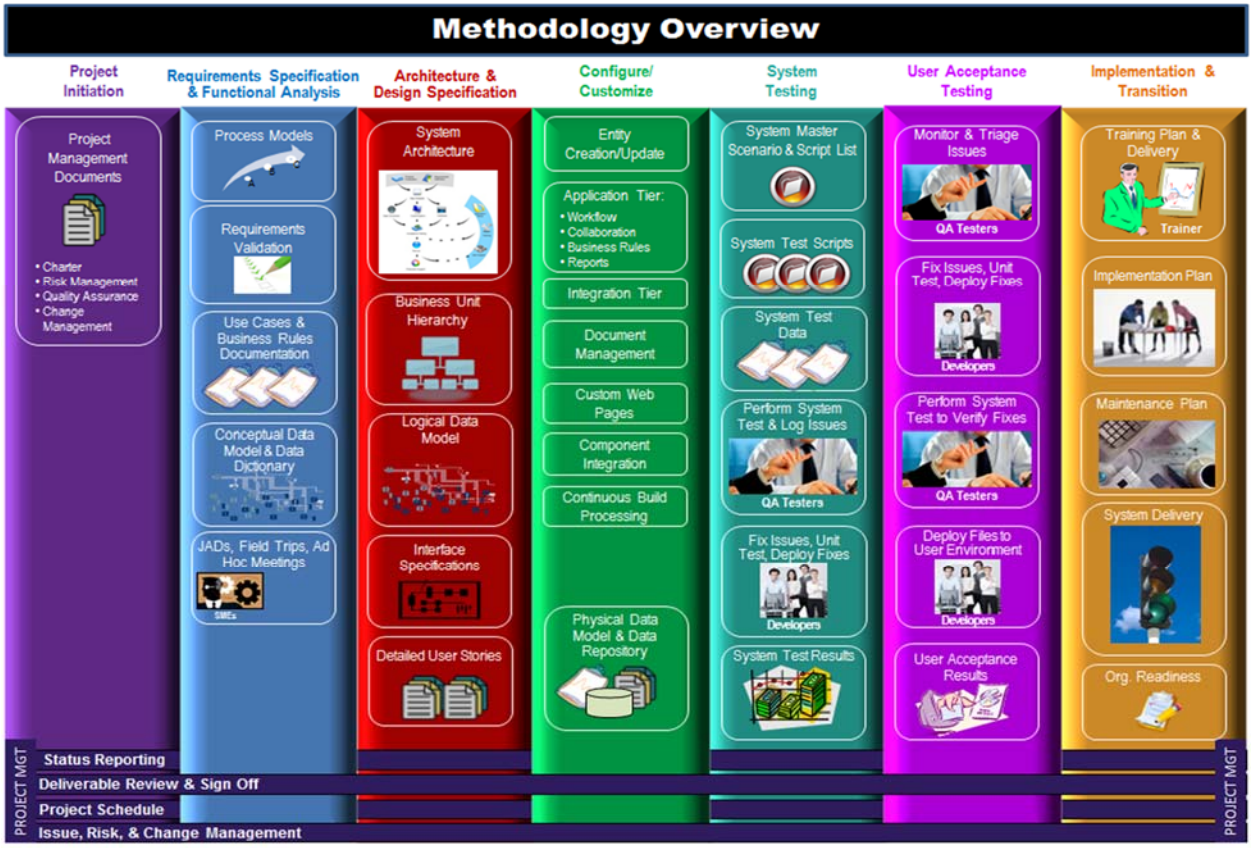
Throughout the response, and in particular the Required Tasks and Overview, we provide screenshots and functional descriptions from these systems to demonstrate proven approaches to constructing the MAEDBS functionality. Drawing from this previous experience removes a lot of the guesswork from the design phase, helping us to deliver a system that is both robust but still intuitive.

Delivery Approach and Tools Highlights

Within this offer are several distinct tools that are unique to our delivery approach. These value-add services help us to deliver higher quality solutions more efficiently, and are key elements in our ability to deliver a solution in a short timeframe.

Proven Project Management Approach

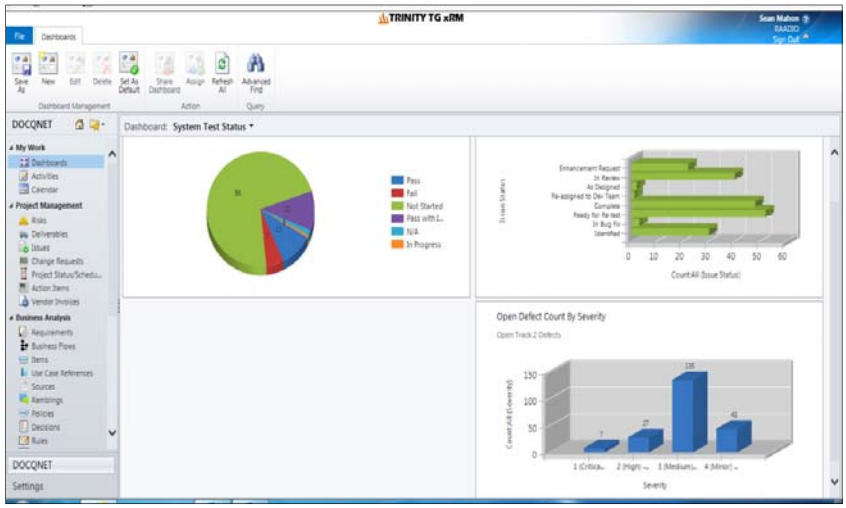
While our team is predominantly technical, they are by no means inexperienced in delivering a structured project management approach. All of our implementation projects are managed within the framework of a proven project management methodology:



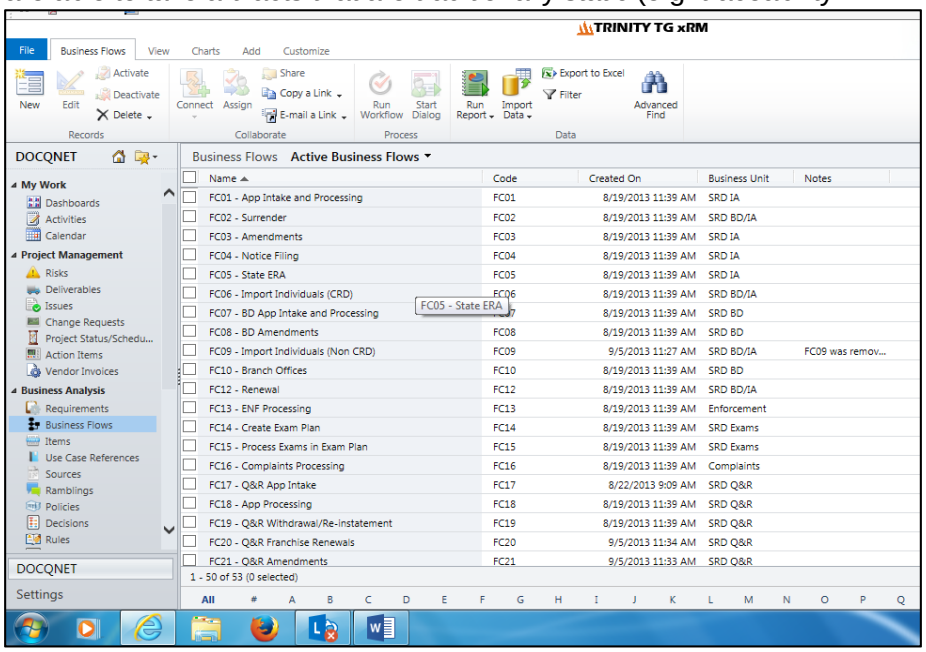
The above diagram presents the entirely of the methodology. For each project, we tailor it up or down based upon the scale of the project and solution to be built. So while the actual tasks and deliverables are specific to the statement of work defined in this RFO, we structure and manage the work based upon this methodology. The proposed project schedule lays out the RFO's tasks and dependencies based upon this approach.

Project Management Repository

For the duration of the project, we provide a hosted project management tool that gives all stakeholders access to project deliverables, risk/issue registers, change control, status reports, and other project management status updates. The repository also provides information about requirements traceability, design/development progress, and testing progress.



This tool centralizes all project activities in a single place, providing a real-time view of project progress. In addition, we are able to take artifacts that are traditionally static (e.g. traceability matrices) and manage them in an electronic format.



This tool gives us the ability to deliver an unparalleled level of transparency to our customers, as the entire status and progress of the project is available to all stakeholders. This tool is provided at no cost to the Energy Commission for the duration of the project.

Tools for Modeling the User Experience

iRise is a web application simulation tool that allows us to build working prototypes of webpages, complete with a CSS, hyperlinks, and even mock data for reference table values. The simulation is provided in a format that is readable by the iRise Reader, a free download that works with Internet Explorer to render the simulation and allow users to literally click through the webpages as if they were navigating directly through the system. This tool significantly speeds up the UI development process, as we are able to have non-technical users develop and render a user experience for review and approval prior to developing the final version of the user interface.

Tools for Measuring Compliance

Sortsite is a tool that is designed to check websites for accessibility standards compliance. The tool runs on the entirety of the website and provides feedback about specific deficiencies on a page and to what standard they map. For MAEDBS, we will use Sortsite to check for Section 508 compliance standards. While there are many additional accessibility standards, Section 508 compliance provides a federal baseline that is both thorough, but flexible enough to allow for technology advances that the standards may not yet address.

Delivery Timeframe

These tools, along with the firm and personnel experience, give us the capability to propose an implementation timeframe that's nearly half of the original expected timeframe. We have proposed a 14 months implementation timeframe, which is possible due the extensive business domain expertise our team has, as well as the experience of having built several systems of a similar scale. All of these factors mean that we are not starting from scratch, and that we can quickly get up to speed on your business and deliver a quality solution by mid-2015.

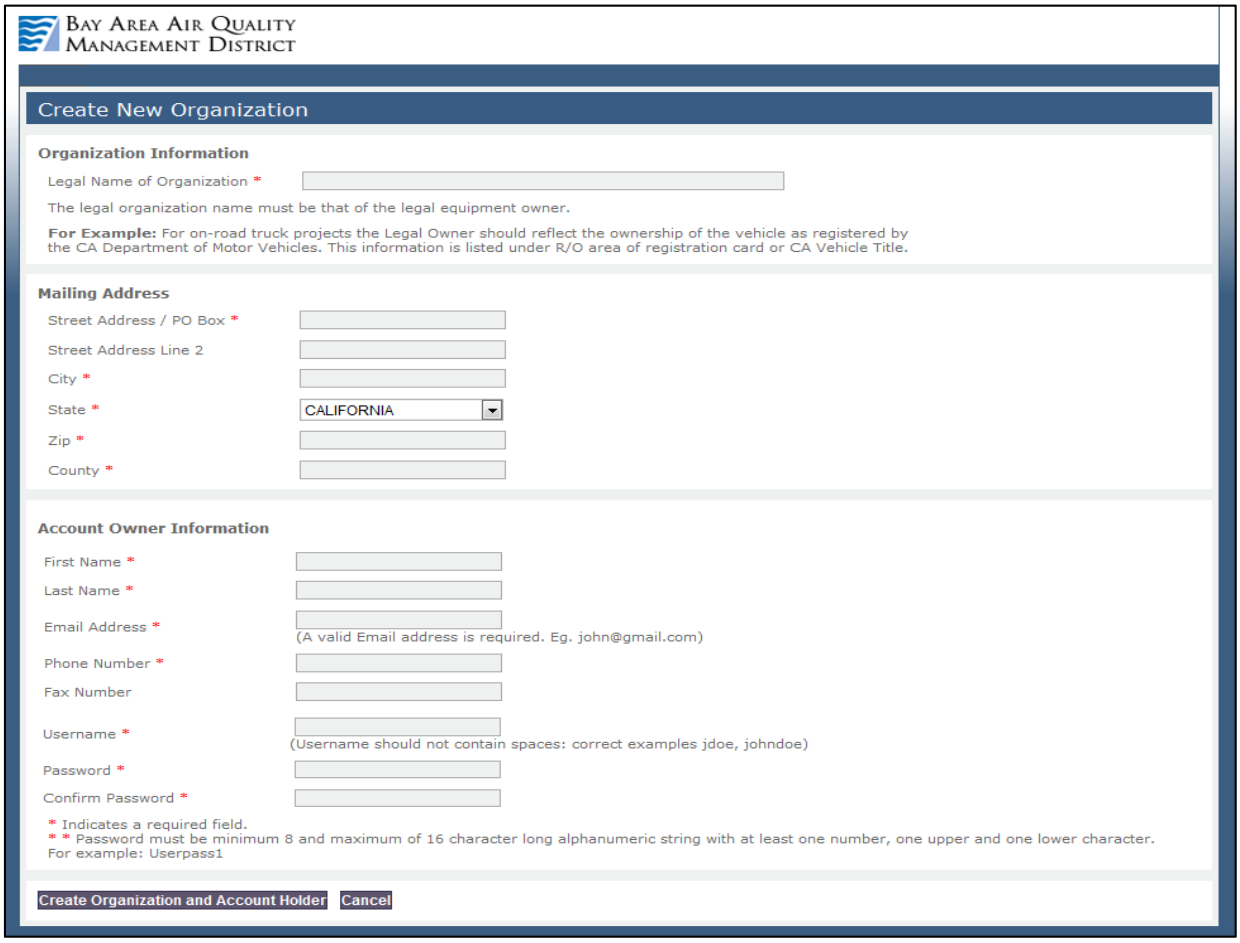
4. Overview of Required Tasks and Deliverables

In this section of the proposal, we provide a narrative that conveys our understanding of what will be the core functions of the MAEDBS, with particular emphasis on the functions and tasks related to the user experience both for CEC staff and for manufacturers. In this section we reference past implementations that demonstrate how we've approached building similar functionality and present the most salient features/aspects of the design.

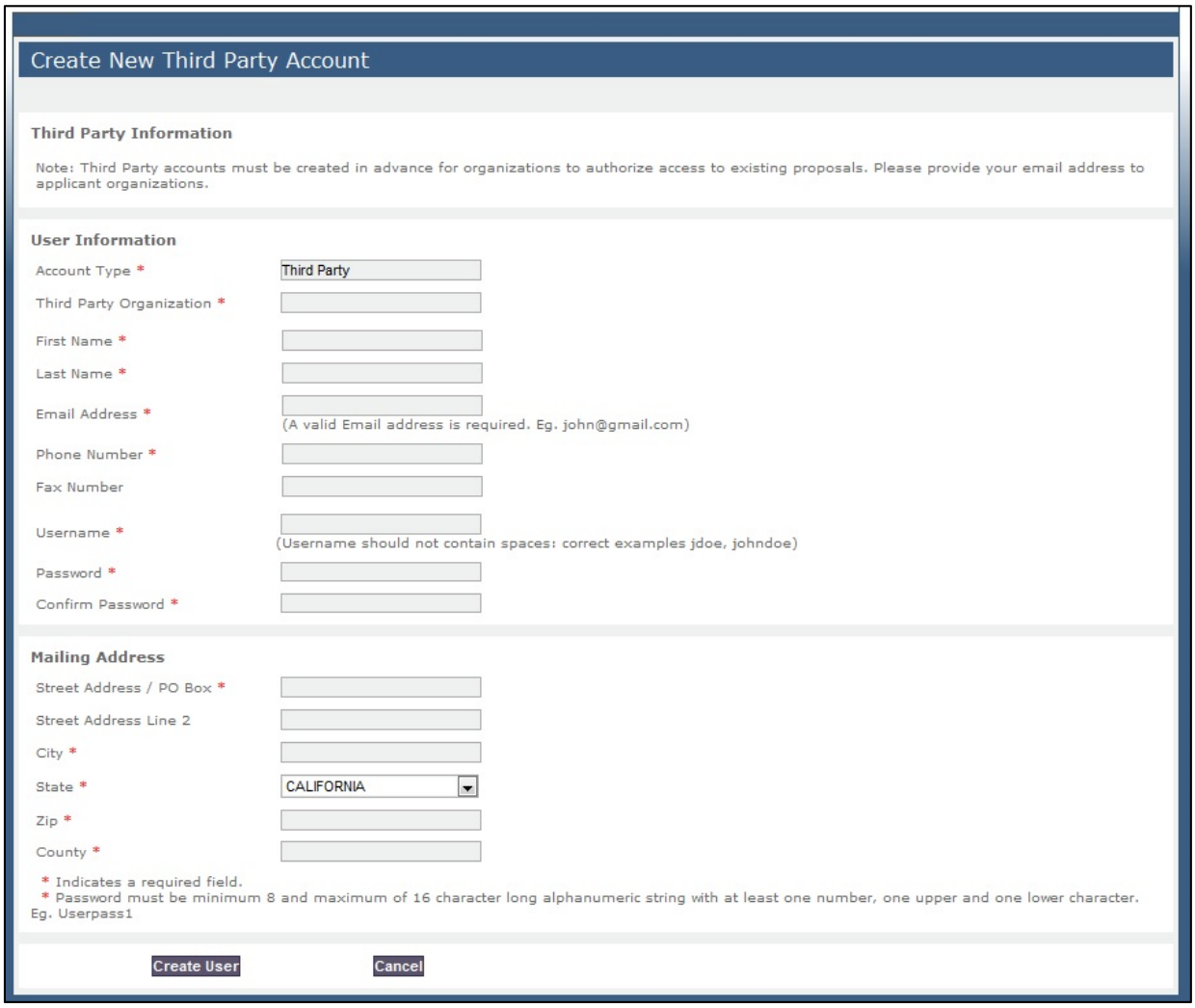
Public Registration and Account Management

Manufacturers and/or representatives will need to log into the website in order to securely submit information about the specific appliance they market in the state. This requires thinking through security features like password management, registration, and secure socket layer connections. But there is also an important design concept, which is understanding how individuals relate to business entities registering in the portal. In this case, the manufacturer needs to register in the portal, but the manufacturer will be represented potentially by more than one user. This means building an account management function that allows users to individually register, but users must be tied to an organization in a child/parent relationship.

We have constructed similar public registration accounts on previous projects. In all cases, the common feature was the registration of an organization and the provisioning of an "admin" level user, who in turn had the ability to manage additional users also registered within that organization. The following screenshot demonstrates this feature:



Our prior solutions also include the ability to register third-party entities. This will be the method used to support third-parties related to manufacturers. Their registration and account functions are unique in that they are limited to only those organizations to which they are associated. A sample of a third party registration implementation is provided below:

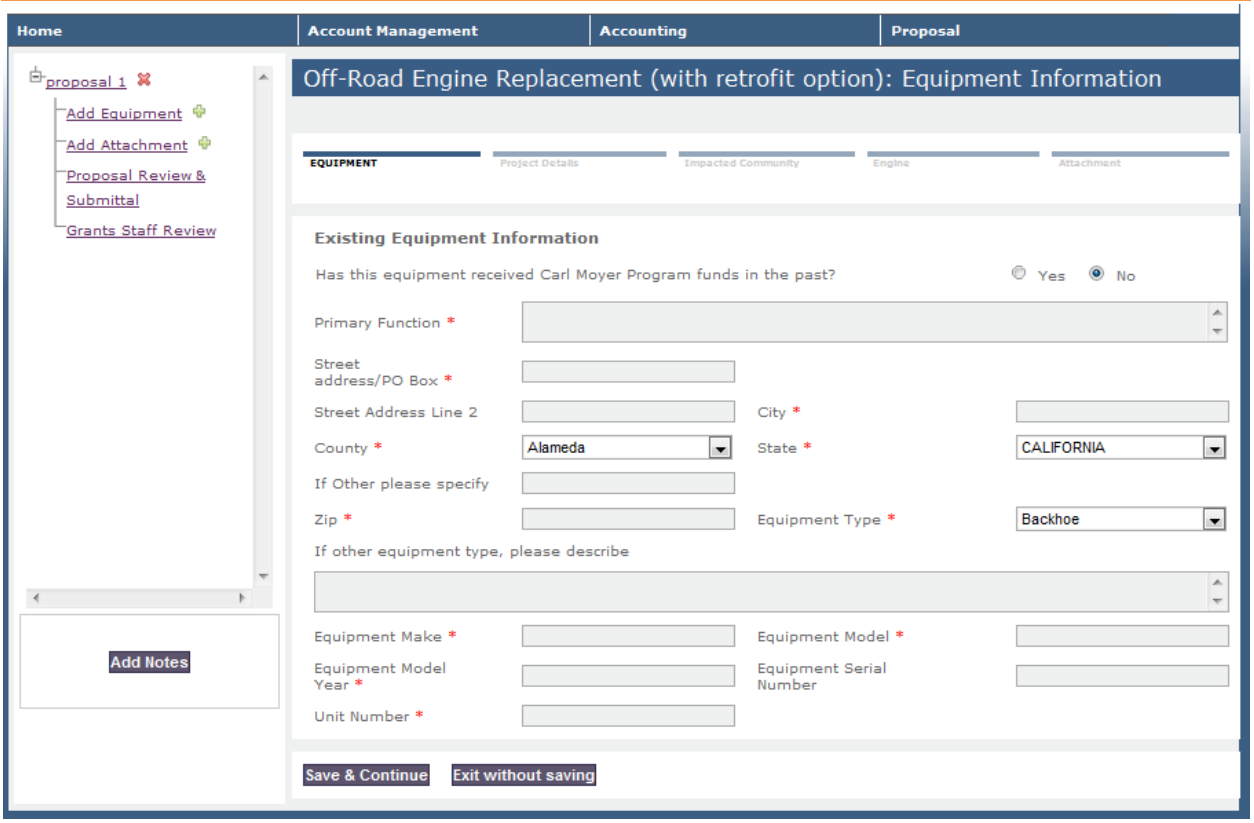


Guided Navigation vs. Tab-Based Navigation

User Interface design is a critical component to a web portal, and we have an approach that takes into account the fact that this solution will support two distinct user groups with very different needs:

1. Public users registering the portal and submitting data
2. CEC staff reviewing the data, running calculations, and finalizing the submittals

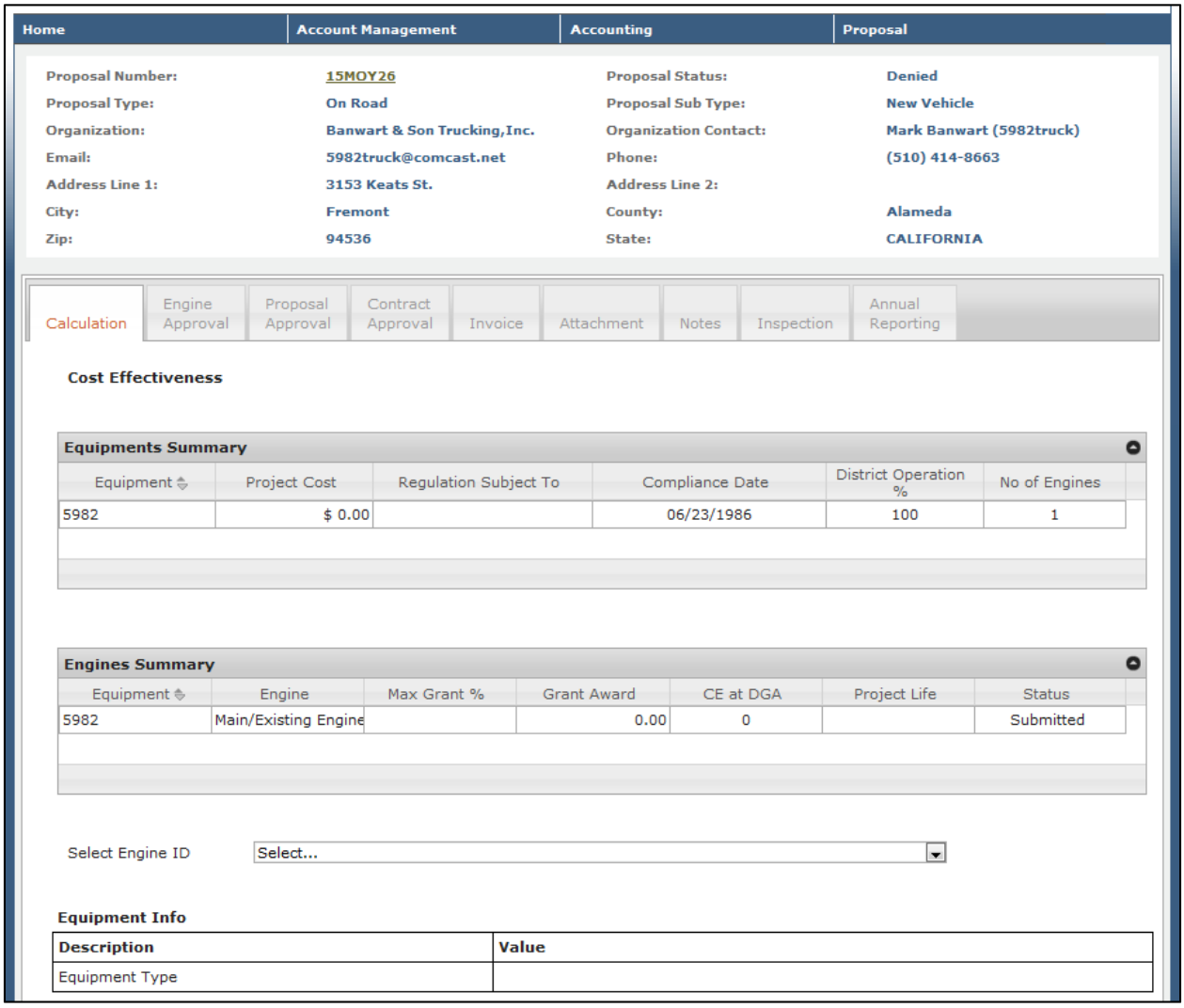
For public users logging into the portal to submit data, they will need guidance in terms of how and what to submit. The design of the UI can help with this. In particular, creating a “Turbotax” style user interface, where the user is guided by a series of visual cues is a great way to facilitate data entry into the system. The following screenshot from a previous solution demonstrates our approach to guided navigation design:



In the above sample, there are several elements to assist the user:

- Breadcrumbs – across the top of the page are visual highlighted elements that show the user where they are in the application steps
- Left Navigation – if the user wishes to navigate to a specific section or subsection, they can do so directly via this navigation
- Save and Continue buttons – it is important to give the user the ability to save as they go. This helps ease the burden of data entry and they can proceed through the application at their own pace without fear of losing data on the entire application.

With internal users, the difference is that they are experts at the business process and do not need the “step by step” guidance. Instead, they benefit from a tab-based navigation that allows them to freely move amongst pages and functions as needed:



As shown in the above screenshot, internal users (much like the CEC staff who will review appliance registrations), have access to all of the steps in the workflow and can move about them as needed. This approach helps to speed up the efficiency of reviews as users can quickly go to the section of the system that is directly relevant to them. Using this approach, CEC staff will have access to a tab-based navigation design for appliance calculation reviews and approvals.

Bulk Data Import

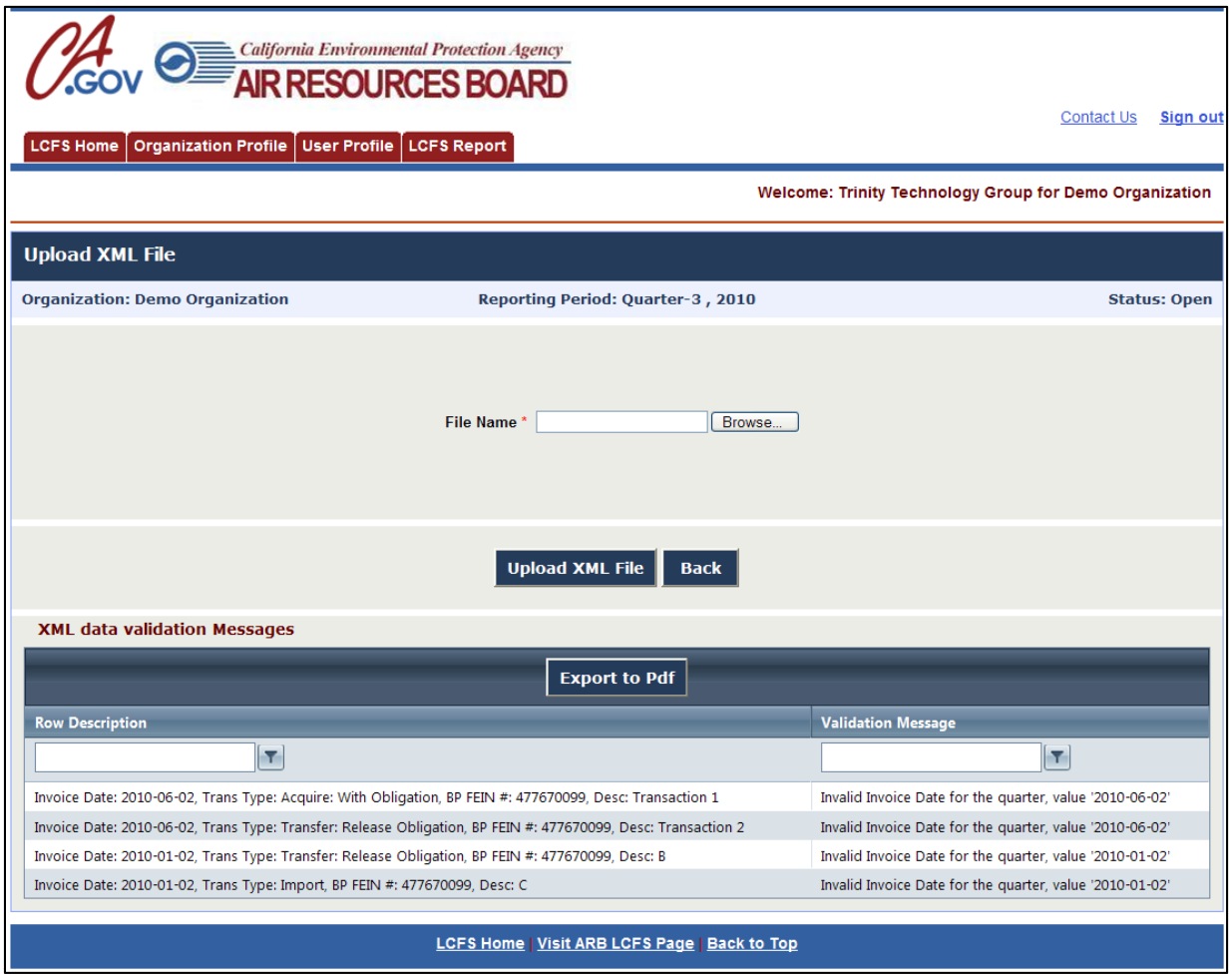
The ability to import, parse, and validate bulk data is a key feature for the MAEDBS. In general, there are three major tasks involved in developing a bulk import mechanism:

- Creating a standardized data input format
- Defining the validation rules
- Defining how to deal with increments

For the first task, CEC already has 70+ spreadsheets that define the specific data inputs. While those are supportable with a new system, we may see opportunities to make slight revisions to the format of the spreadsheets in order to better accommodate incremental data, and/or further automate the determination of appliance type (our current understanding is that the filename of the spreadsheet is the parameter used to determine what calculation to run).

For validation rules, we expect to rely heavily upon the existing system logic, as well as our team's subject matter expert, Sverre, to provide guidelines on what needs to be verified and calculated. The validation rules will be a combination of basic data validation (e.g. number formats are consistent, no special characters, etc.) and calculation related values.

Once validated, the system needs to provide feedback to the user on what records did not validate. Our design approach includes the introduction of real-time feedback. The following screenshot from a previous implementation demonstrates this concept:

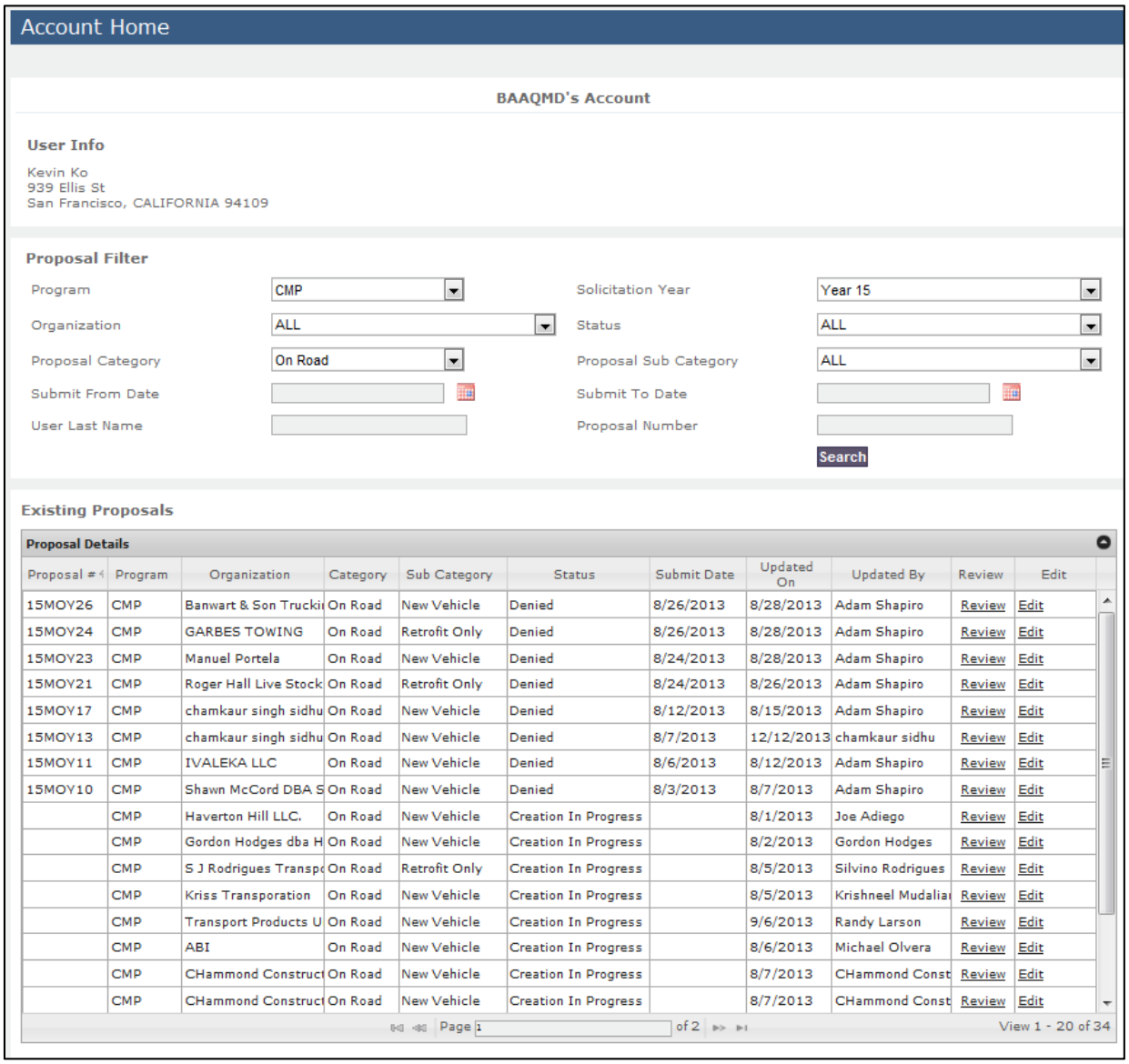


The above sample demonstrates functionality where uses upload a file in a predetermined format, and the system automatically reviews all records and commits those that pass validation rules. Any that do not are reported as exceptions to the user and presented in a table that can be exported for later review. Note that the above example used an XML format, but a CSV or Excel format is also supportable.

With respect to MAEDBS, the key is being able to support the input of new models, as well as updates to existing models. We anticipate the need to maintain an audit history of incremental changes. For example, when a model is updated, only changed data has to be submitted. So the system has to be able to retrieve an existing active record, extract unchanged data, set the previous record into an "archive" state and insert a new record with the new data.

Workflow, Review and Approval

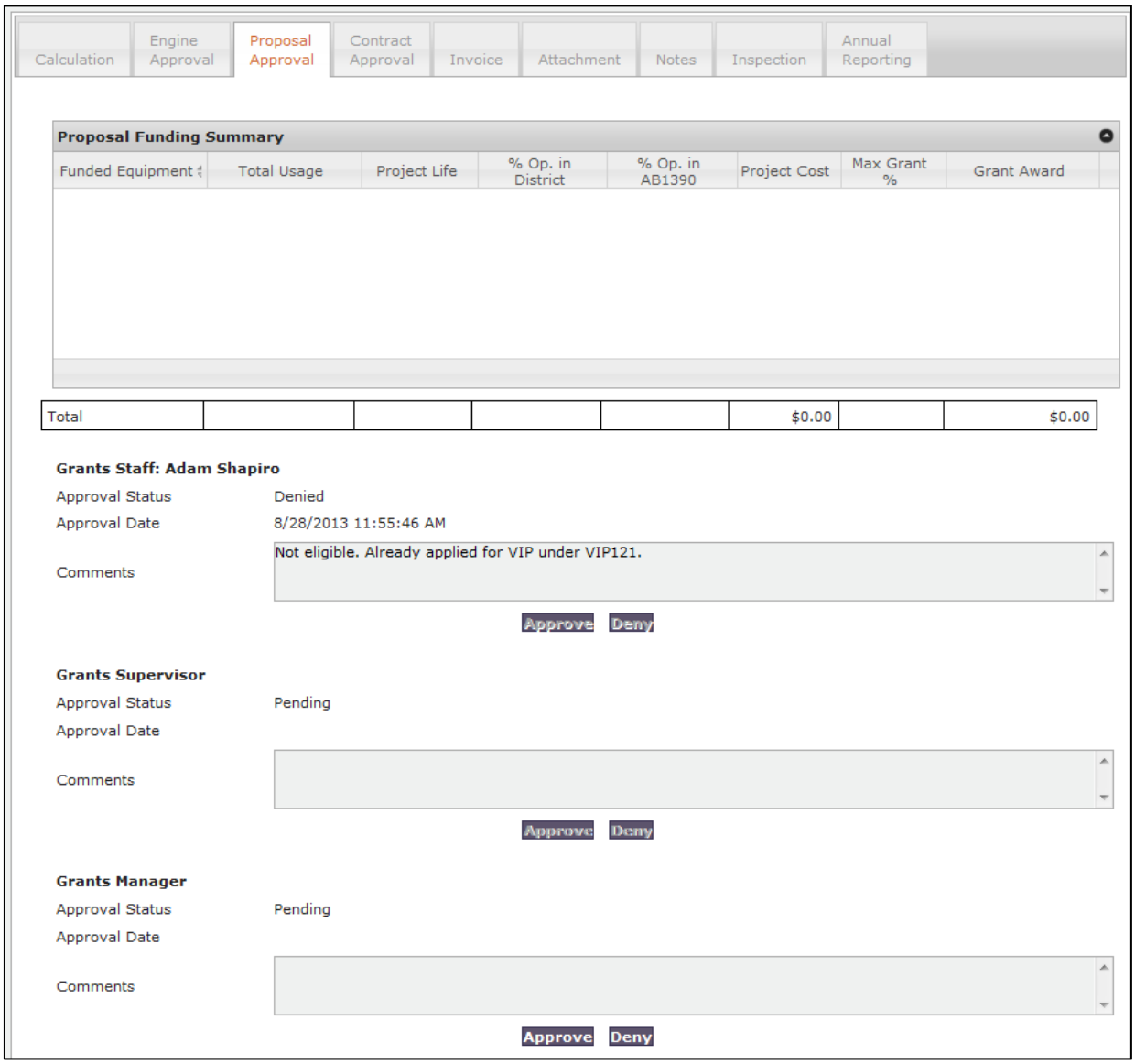
On the internal side of the system, the list of appliance registrations is presented to the user in an "inbox' type of format, like the one shown below:



Proposal #	Program	Organization	Category	Sub Category	Status	Submit Date	Updated On	Updated By	Review	Edit
15MOY26	CMP	Banwart & Son Truckii	On Road	New Vehicle	Denied	8/26/2013	8/28/2013	Adam Shapiro	Review	Edit
15MOY24	CMP	GARBES TOWING	On Road	Retrofit Only	Denied	8/26/2013	8/28/2013	Adam Shapiro	Review	Edit
15MOY23	CMP	Manuel Portela	On Road	New Vehicle	Denied	8/24/2013	8/28/2013	Adam Shapiro	Review	Edit
15MOY21	CMP	Roger Hall Live Stock	On Road	Retrofit Only	Denied	8/24/2013	8/26/2013	Adam Shapiro	Review	Edit
15MOY17	CMP	chamkaur singh sidhu	On Road	New Vehicle	Denied	8/12/2013	8/15/2013	Adam Shapiro	Review	Edit
15MOY13	CMP	chamkaur singh sidhu	On Road	New Vehicle	Denied	8/7/2013	12/12/2013	chamkaur sidhu	Review	Edit
15MOY11	CMP	IVALEKA LLC	On Road	New Vehicle	Denied	8/6/2013	8/12/2013	Adam Shapiro	Review	Edit
15MOY10	CMP	Shawn McCord DBA S	On Road	New Vehicle	Denied	8/3/2013	8/7/2013	Adam Shapiro	Review	Edit
	CMP	Haverton Hill LLC.	On Road	New Vehicle	Creation In Progress		8/1/2013	Joe Adiego	Review	Edit
	CMP	Gordon Hodges dba H	On Road	New Vehicle	Creation In Progress		8/2/2013	Gordon Hodges	Review	Edit
	CMP	S J Rodrigues Transpo	On Road	Retrofit Only	Creation In Progress		8/5/2013	Silvino Rodrigues	Review	Edit
	CMP	Kriss Transporation	On Road	New Vehicle	Creation In Progress		8/5/2013	Krishneel Mudaliar	Review	Edit
	CMP	Transport Products U	On Road	New Vehicle	Creation In Progress		9/6/2013	Randy Larson	Review	Edit
	CMP	ABI	On Road	New Vehicle	Creation In Progress		8/6/2013	Michael Olvera	Review	Edit
	CMP	CHammond Construct	On Road	New Vehicle	Creation In Progress		8/7/2013	CHammond Const	Review	Edit
	CMP	CHammond Construct	On Road	New Vehicle	Creation In Progress		8/7/2013	CHammond Const	Review	Edit

With information including status and to whom the record is assigned, this approach allows us to create workflow queues where each registration goes through a defined process, with hyperlinks to initiate the process (e.g. the "Review" link in each record).

Another example of a common process are reviews and signoffs. We have developed similar functionality, like the sample shown below:

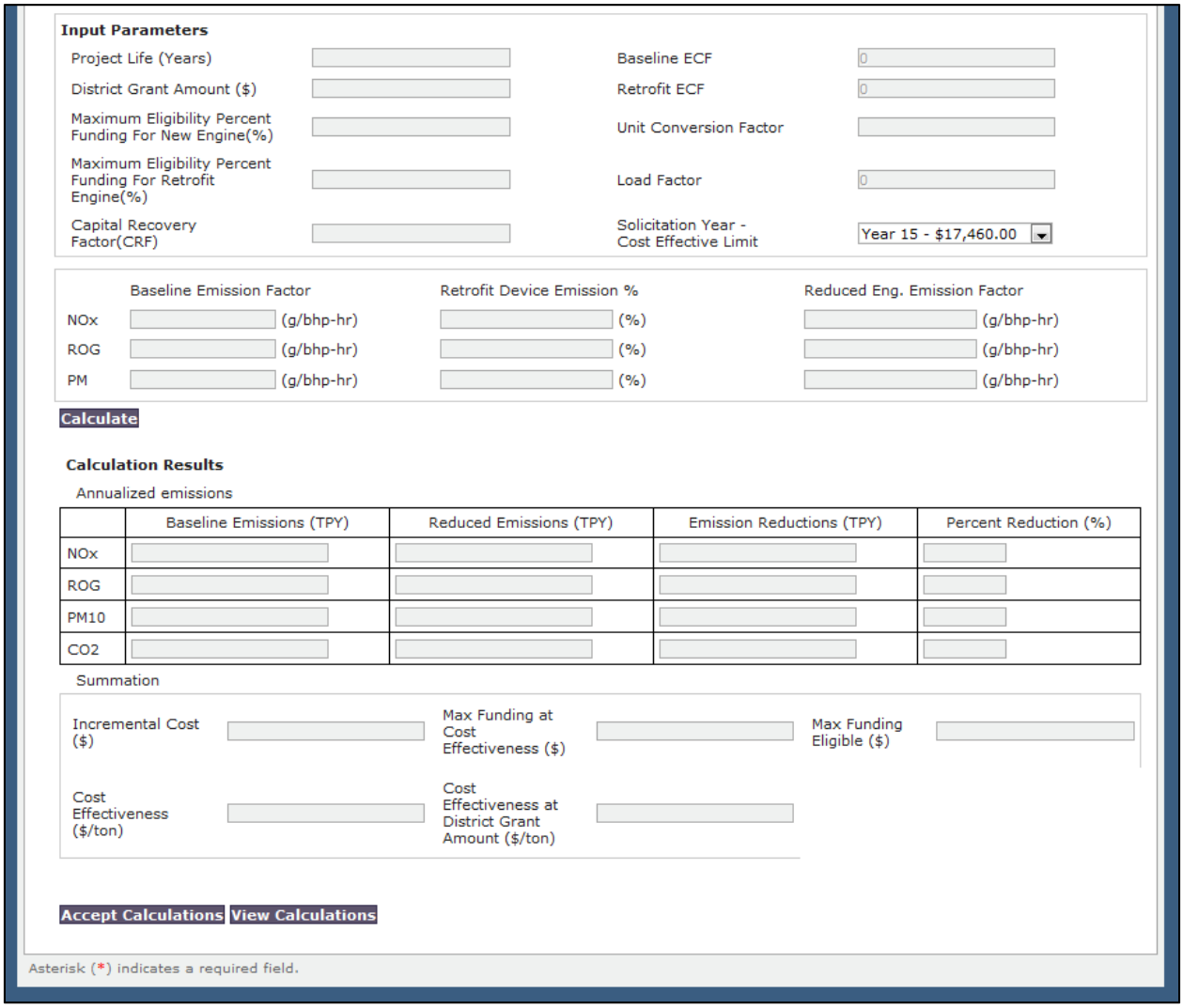


Functionality like this can be developed to allow for different individuals in different roles to approve a registration. Also implicit in this functionality is role-based security. Specific users would need to be assigned roles such as “Supervisor” or “Manager”, at which point the system would automatically provide them the capabilities needed to fulfill functions specific to those roles.

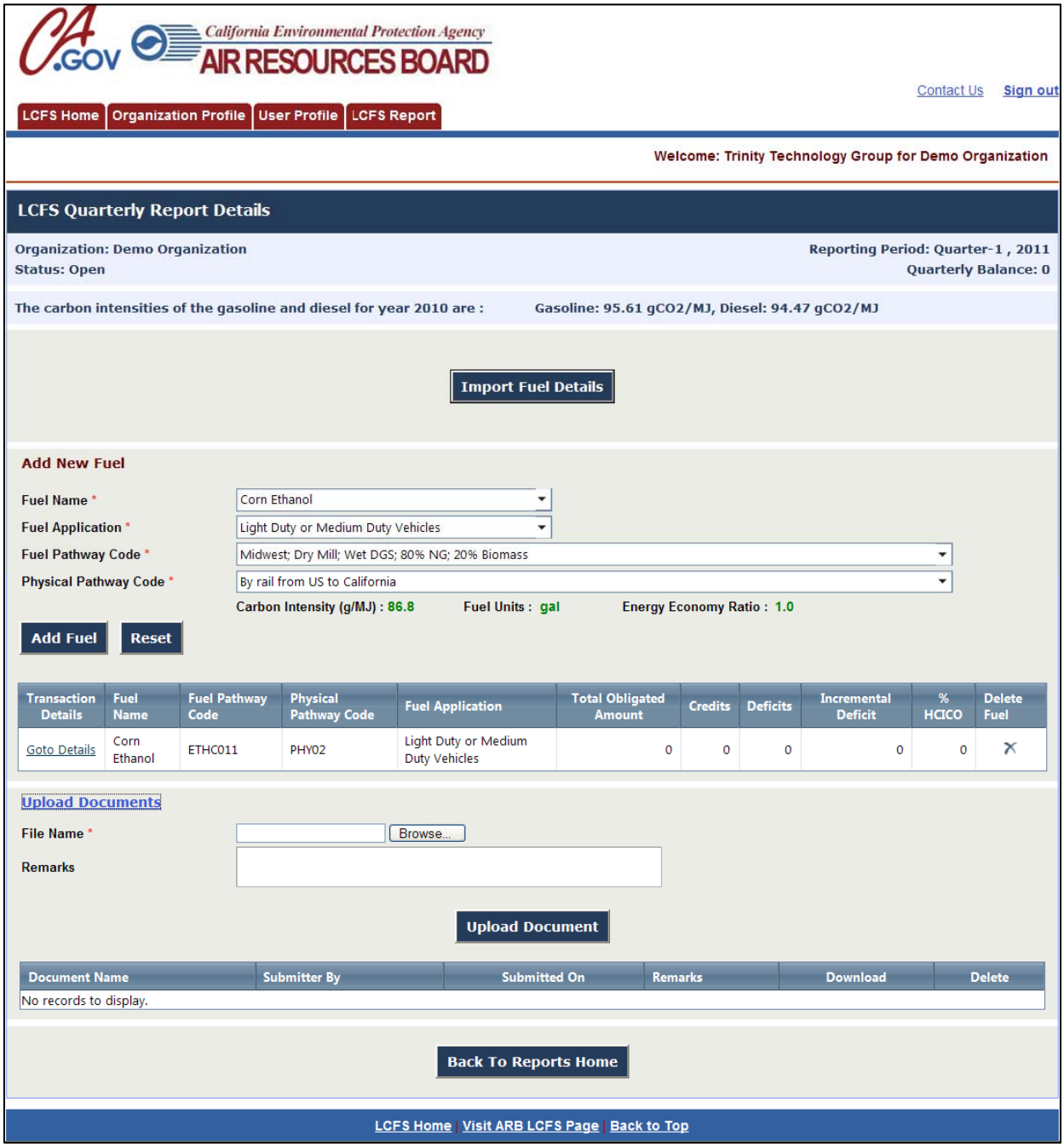
Calculations

Each appliance registration must go through a calculation to determine if the appliance meets specification. For each appliance, there are different columns to uniquely identify an appliance model. The primary attributes include manufacturer code, brand code and manufacturer’s model number. A secondary level of identifying attributes include voltage, energy source, phase, insulation, volume, and heating/cooling capacity. Based on these identifying fields, the specifications an appliance has to meet are determined. That could be as simple as containing a type of switch or it could be simple calculation (sample: adjusted volume = ((FreezerVolumeCuFt*1.63)+FreshFoodVolumeCuFt)).

For calculated values, we have two approaches to offer depending on the business use case. One approach is data input driven. This is a scenario where equations have been automated, but the input parameter values are either entered by the user or defaulted by the system based on a reference table. This approach is helpful if the parameters and or calculations change often, and is likely the closest to what CEC is looking for in the functional requirements. A sample of this approach from a system that automated similar scientific calculations is shown below:



Another approach is to fully automate the calculation mechanism, where all inputs and parameters are managed by the system. In this design approach, the system would not display a calculation page like the one shown above. Instead, it would only provide the direct calculated values as feedback. A sample of this approach is shown below:

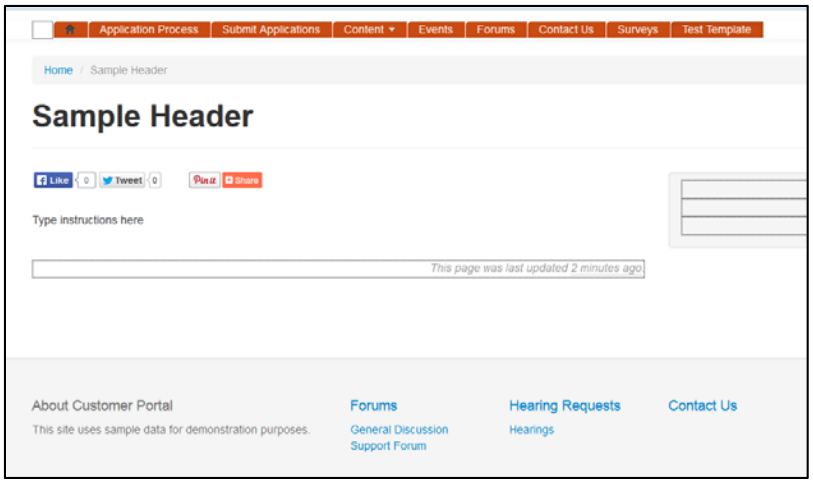


In the above example, metrics such as the quarterly balance in the header, the credit/deficit amounts, and chemical composition percentage are all calculated by the system internally. Only the output is shown to the user. This approach is by far the most user friendly, but if the calculations change often this requires additional customization and maintenance.

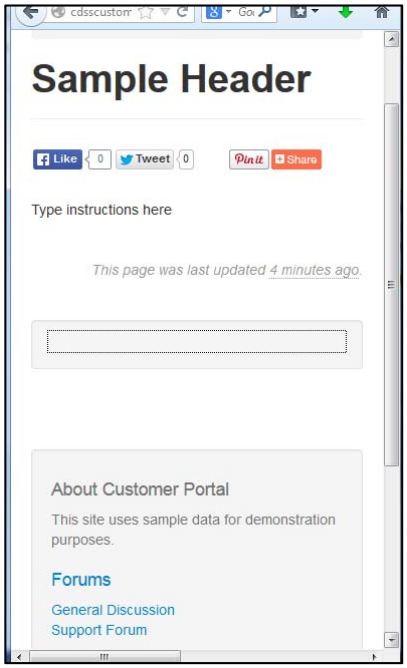
Mobile

The CEC's mobile requirements speak to the need to be able to see and search data, but not necessarily have full functionality. This is consistent with the mobility approach – give users those core functions they would most likely seek on a smaller screen. But in contrast to the requirements that separate pages be developed, we'd like to propose an alternative design that includes using Responsive Page Design. This is a design approach where the pages automatically resize and

reshape artifacts to accommodate any sized screen. Most modern web pages use this functionality. It involves the incorporation of a custom css script that, once deployed, automatically manages all the page reshaping and requires little to no maintenance. Not only would this simplify the implementation effort (since the same set of asp.net pages can be used), but is simplifies ongoing maintenance for CEC since there will not be a separate set of mobile pages to update and maintain whenever the master web page changes.



The sample on the left demonstrates a typical web page on a wide-screen desktop



computer. With responsive page handling, the same web page is resized down to a skinnier view that would normally be seen on a smartphone. The page is literally resized in real-time based on the device and the browser, providing mobile access not just to a subset of features, but to as much or as little functionality as CEC would want to provide for mobile users.

5. Work Plan for Implementing the Solution

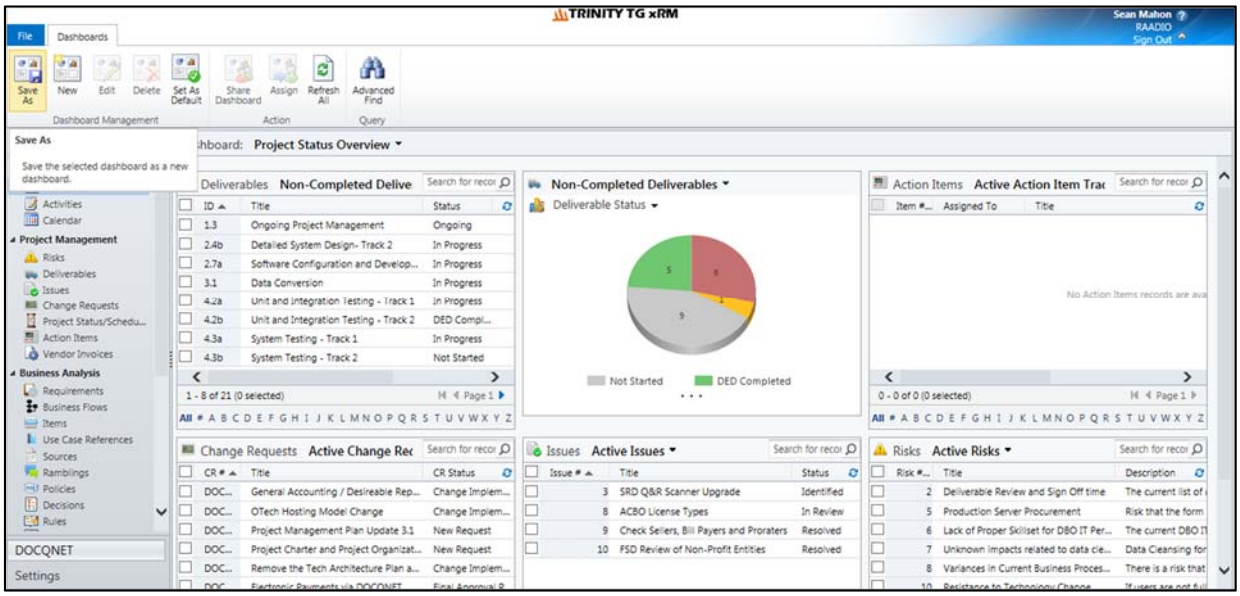
In this section we provide the highlights of our work plan and approach to completing the project. This work plan is based upon the project schedule presented in Section 7 of this proposal.

Given the scope of work and the budget parameters, we are proposing an implementation period of 14 months from the start date of the project. We have used June 2, 2014 as the hypothetical start date for planning purposes, but this schedule would apply regardless of the actual start date. The proposed go-live date is July 31, 2015. The four month warranty would commence from 8/1/2015 through 11/30/2015.

The work plan incorporates a 10 business day review period for all written deliverables, followed by a 5 business day update and finalization period where TrinityTG/C&G Team staff work with CEC staff to address comments, incorporate updates, and achieve signoff. If during the 10 business day review period no comments are received then the deliverable is considered approved and the 5 business day update period is not required. If, based on the dependencies in the work plan, this allows for work to begin earlier than planned, then the team will commence as soon as possible on each task.

Managing Project Work

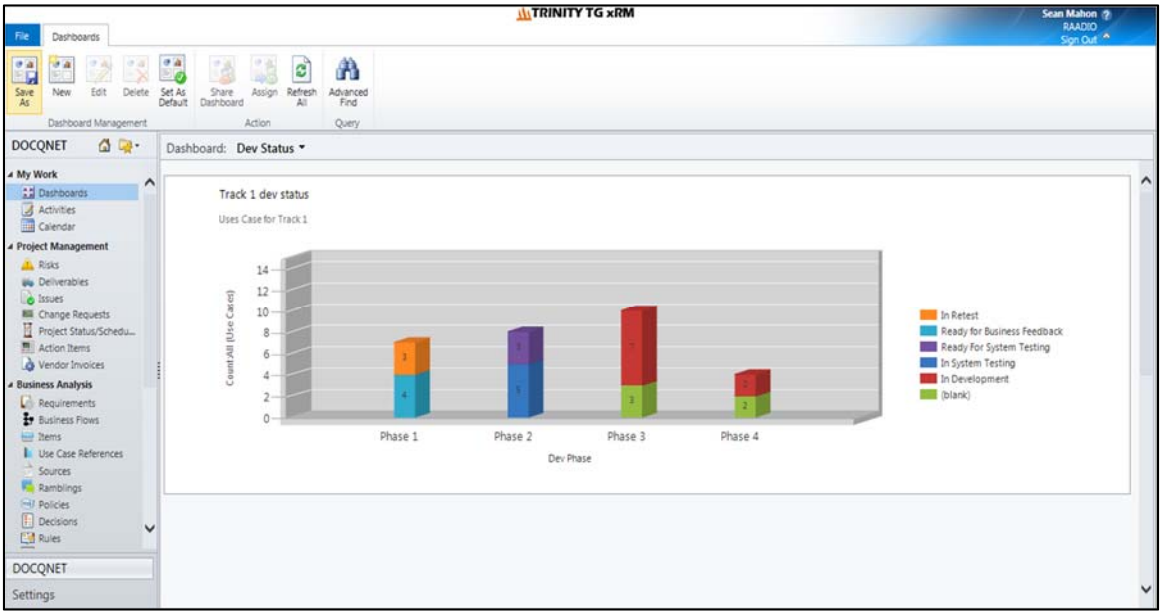
In support of managing the work plan throughout the project lifecycle, we provide a unique tool to managing the project. TrinityTG's project management approach includes providing to all CEC project team stakeholders a free license to use our project management repository tool for the duration of the project. This tool, based on Microsoft Dynamics CRM, is a custom business solution we have tailored specifically to manage projects in the State of California.



The tool provides a repository for tracking all of the project's issues, risks, action items, changes, deliverables, and status reports. A dashboard provides a snapshot view of the project's health, showing the status of deliverable progress at any point in time. Official copies of deliverables are stored in this repository for all project stakeholders to access.

While the tool started out primarily as a project management tool, we have evolved it to become a full-fledged Software Development Lifecycle Tracking tool, with capabilities to track the following:

- **Requirements Traceability** – as discussed in Section 6, this project repository supports a full traceability matrix, and includes ad-hoc reporting features for easier access to the project. In contrast to a static traceability spreadsheet, this tool provides the ability to query on traceability updates in real-time.
- **Design/Development Artifact Traceability** – development artifacts are inventoried and traced back to requirements, providing an unprecedented level of traceability all the way down the build progress. As shown in the following example, we are able to provide dashboards that show point-in-time development progress, something that is traditionally a "black box" to customers:



- **Release Management Tracking** – releases are documented in the repository, providing a granular view of environment release information
- **Test Tracking** – system test scripts are mapped to their corresponding use cases and tracked in the repository. Defects are also logged and tracked in this repository, allowing for a detailed level of test progress reporting. The system test capabilities are discussed further in the Solution Test Plan section of this response.

Work Plan Phases

The following tables describe each phase of the project and provide details about tasks to complete and major dependencies.

Phase	1 - Project Management
Timeframe	6/2/2014 – 11/30/2015
Description and Tasks	Project Management includes the development and maintenance of the Project Management Plan, Bi-Weekly status reporting, and project schedule maintenance by the proposed Project Lead. The Project Management Plan will also be updated as needed if the project's governance structure needs to be modified during the project duration. At the conclusion of the project, we will provide the Final Acceptance Document to certify completion of the project.
Dependencies	The thread of the project occurs concurrently with all tasks throughout the duration of the implementation period.

Phase	2 – Analysis
Timeframe	6/3/2014 – 9/5/2014
Description and Tasks	During this phase of the project, the TrinityTG/C&G Team analyzes the existing systems to determine core functionality, calculation logic, and data attribute requirements. We also plan on going through the inventory of appliance spreadsheets to better understand the similarities and differences amongst the appliance categories. Staff will be interviewed to gain an understanding of the business process and functional specifications, as well as validate our understanding of the functional requirements. The validated requirements are mapped to the process model diagrams, and are included in the Requirements Document. We also create a traceability matrix that is managed in the project repository.
Dependencies	Because the analysis phase begins at the start of the project, there are no key dependencies on previous tasks. It is important that the TrinityTG/C&G Team have the proper staff on the ground to conduct the functional analysis.

Phase	3 – Design
Timeframe	6/26/2014 – 10/29/2014
Description and Tasks	During this phase of the project, the TrinityTG/C&G Team begins the design of the MAEDBS. This includes: • Creation of the entity relationship diagram • Creation of the logical data model • Design of the service layer and common framework • Design of the data access layer • Design of the presentation layer These design details are consolidated into the Detailed Design document deliverable for this phase.
Dependencies	The design phase starts with functional specifications (Use Cases). These are derived from staff interviews, validated requirements, and system reviews. These tasks are completed about halfway through the Analysis phase, allowing us to commence on functional specifications while the remainder of the analysis phase wraps up. Database design, a key task in this phase, can commence once the inventory of appliance forms is completed. This is because the database is dependent upon having a complete set of data attributes before the relational model can be fully completed.

Phase	4 – Build
Timeframe	8/27/2014 – 3/9/2015
Description and Tasks	During this phase of the project, the TrinityTG/C&G Team develops the custom MAEDBS system. The physical database and data access layer are built, comprising the data layer. The bulk of the development effort consists of developing the logic tier, which will contain all of the services and common functions accessed throughout the system. Custom components are unit tested as part of this effort. The presentation layer is developed during the latter part of the build phase. It is preceded by the creation of an iRise simulation that is used to demonstrate the look and feel of the system.

	In this phase we provide the "empty" database as the verification of the data tier, Unit Test results to verify completion of the logic tier, and the iRise simulation as verification of the presentation tier.
Dependencies	Similar to the design phase, the build phase has several tasks that can begin in advance of the design phase being completed. Data tier work can begin upon completion of the logical data model. Even if the data model changes during review of the Detailed Design, changes are fairly easy to make to the physical database, and rarely impact the data access layer. These are the tasks that are scheduled first in the build phase. The bulk of the logic tier, however, are dependent upon completion of the Detailed Design deliverable. The logic tier is highly dependent upon having the business logic finalized, so we don't plan on starting that until the end of the build phase. The critical path for the build phase is the presentation layer – with a large number of web pages to develop, and a dependency on having the draft web page simulation approved before development of the pages can begin, this is an important sub-task that needs to be prioritized.

Phase	**5 – Test**
Timeframe	8/11/2014 – 6/30/2015
Description and Tasks	During this phase of the project, the TrinityTG/C&G Team conducts system testing, regression testing, performance testing, and user acceptance testing. The phase begins with the development of the Master Test Plan. This test plan is completed and approved well in advance of the start of testing, which is why the start date of this phase coincides with the start date of Build. Actual system testing begins upon completion of the presentation layer, which is scheduled for mid-February 2015. The functional resources execute test scripts and log results in the project repository. System test (and related performance/stress testing) continues through April 2015. The System Test Results deliverable is provided to CEC in early May. Acceptance Testing starts with the development of the Recommended UAT Plan in November 2014. But actual UAT does not commence until System Test has been approved, which would be mid-May 2015. The UAT Results deliverable is provided to CEC in June 2015.
Dependencies	Development of the Master Test Plan begins once the functional resources have completed the Use Case/Business rule documentation during the design phase. Test execution can being only after completion of the presentation layer. This is an obvious dependency in that users cannot functionally test the system until the presentation layer is fully integrated. UAT is dependent upon completion and acceptance of System Test results, so the work plan tracks a strict dependency between the two.

Phase	6 – Deploy
Timeframe	10/30/2014 – 7/31/2015
Description and Tasks	During this phase of the project, the TrinityTG/C&G Team conducts a variety of activities related to implementation and readiness of the MAEDBS. The first, and longest, portion of this phase is data conversion. Data conversion starts in October, 2014 with data mapping of the legacy source systems to the target database. This is followed by the creation of scripts that transform the data into the necessary format. Iterative mock conversions occur throughout the lifecycle of the project, culminating in a final conversion just before the go-live date on 7/31/15. Training is also part of this phase. Training commences with the creation of a training plan and training materials from mid-May 2015 to mid-July 2015. As per the RFO, the first half-day live session occurs on 7/10, followed 10 business days later with a second session on 7/24. This schedule helps to ensure that training occurs as close to go-live as possible. Final deployment preparation starts on 6/30 – 7/2/2015, with the delivery of the production-ready version of MAEDBS. This includes both the final web pages, as well as the fully integrated application. The CEC reviews the final version of the web pages in production, along with the entirety of the application for 20 business days. Concurrent with this review, the TrinityTG/C&G team fix defects found during the course of the production review. At the end of the 20 day review period, the system is ready to go-live on 7/31/2015.
Dependencies	Data conversion is dependent upon completion of the logical data model, as this defines the target database and is necessary to conduct data mapping. Having production-ready data is a necessary precursor to being able to go-live. Training Plan and materials development are planned around the availability of the functional resources (e.g. after completion of UAT). Production deployment is dependent upon all of the preceding tasks being completed, including: • UAT signoff • Training having been delivered • Production system being reviewed and signed off after 20 business days • Data having been converted

Phase	6.7 – Final System Transition, Warranty, & Final Acceptance
Timeframe	8/3/2015 – 11/30/2015
Description and Tasks	During this phase of the project, the TrinityTG/C&G Team provides ongoing maintenance and support for four months from the production go-live date. Also during this period we conduct knowledge transfer sessions with CEC staff. We propose monthly sessions to review a series of topics related to administration and maintenance of the system. At the end of the warranty period, the Project Lead provides CEC with the Final Acceptance document.
Dependencies	The commencement of the warranty period is directly dependent upon the actual go-live date.

6. Outlines of what Deliverables are Proposed

In this section we provide outlines and/or descriptions of the written project deliverables that will be provided. These deliverables map to the deliverables identified in the RFO for each major Task.

Project Management Plan

The project management plan is a crucial part of our project management approach. It is assembled to include all of its constituent parts to effectively manage and oversee the effort. The schedule, a key component of the project management plan, is crafted and used to ensure that tasks, dependencies, and environment needs related to building the infrastructure are planned for and given adequate time to complete. The plan provides sub plans for the management of all of the plans listed in the RFP as well as other topics necessary for managing the project: Scope Management, Document Management, Communications, Risk, Issues Management, Change Control, and Configuration Management.

Scope Management Plan

Scope management is the task of monitoring the status of the project scope as well as managing changes to the scope baseline.

The project scope will primarily be managed through the project's scheduled reviews such as Weekly Status Meetings, monthly Steering Committee Meetings, and through the change control process. Communication will play a key role in scope management.

Although the objective is to have little or no change to the project scope, some changes should be anticipated. In the event that scope changes occur, the changes will be identified through the Change Control Plan. As changes to technical and business requirements, hardware, software, documents, and system design are identified; the impact to the project's scope will be assessed and addressed during the formal Change Control process. There are several tools and plans that will be used to control scope on the project:

- **Project Charter** – The Project Charter establishes the overall purpose and scope of the project, defining key business objectives that drive decision making about scope details.
- **Project Deliverables –** The deliverables listed in the RFP response are key work products that define the overall scope of the project.
- **Change Control Plan –** If a change to scope is required, the change control plan will dictate how the change needs to be handled.
- **Requirements Matrix –** This tool will be made available on the project repository. It includes a list of base-lined requirements from which the requirements can be traced at any point during the project, forward or backward, and reconciled to all deliverables throughout the project life cycle. Requirements will be added to this list as part of an ongoing process, new requirements that are added will be reviewed by the PM team to determine the estimated release for them, inclusion on this list does not mean that they are inherently part of the scope of work to be completed as part of this project.

Document Management Plan

Document Locations

The primary location for managing and storing key project documentation is the CRM repository. Deliverables, for example, are stored as attachments in the corresponding record in the Deliverable

entity. Both a PDF version and a "working" version are maintained. Other documents that are managed primarily through the CRM repository include:

- Weekly Status Reports
- Change Control Forms
- Updated version of the Project Plan

Naming Conventions

Official deliverable documentation will have a standard naming convention that identifies the Deliverable Number and Deliverable Name. Example: "1.2 –Project Management Plan" Version numbers and/or dates in the title should be avoided in order to maintain consistency.

For unofficial documents or artifacts (e.g. meeting notes, reference documents, or diagrams that are components of a deliverable) the above standards do not need to be enforced. However, these artifacts should be logged into the CRM repository against a corresponding record; the record provides a create date/time along with a record of who created the artifact.

Versioning

Draft version of deliverables and other documents will not be officially tracked, but will have a "Draft" notation in the document title, along with a watermark to denote it as an in-progress document. Once a version is submitted for review, it receives a 1.0 version number in both the title page and in the document version history tracked within the deliverable itself. The title is updated to include a "FINAL" suffix, and any watermarks are removed. The document will be specified as the initial submission in both the file name as well as in the version history.

When a deliverable is returned for review with comments, updated and resubmitted, it receives an updated version number (2.0) and so forth.

The Final signed version of each deliverable will not only be stored on the share drive but it will also be stored in the CRM project repository as an official copy of the project document. Each deliverable will have an associated record against which progress can be tracked.

Incremental versioning will be used for updates to the deliverable that occur after it has been finalized, but that do not require a signature from the Project Sponsor in order to be approved. The CDE Project Manager will have the authority to decide on whether a deliverable update can be incremental versus requiring a signature from the Project Sponsor.

Document Templates

All project documentation, particularly deliverables, make use of several formal templates that will be used for the duration of the project. These templates are available in the CDE project shared drive. The following table lists key document templates that will be the basis for all project documentation:

Template	Used For:
Deliverable Expectation Document (DED)	Submission of DEDs for client approval as a precursor to developing the deliverable content
Deliverable Approval Document (DAD)	Submission of a signed, approved deliverable as part of the invoicing process. The DAD accompanies the actual signed deliverable as part of the package that confirms work has been satisfactorily completed for that deliverable.
Deliverable Template	All deliverables and MS Word work products make use of a standardized template for documents, which includes a cover page, signatory page, table of contents, and preformatted headers and footers.

"Living Documents"

Many project documents, particularly those related to technical details and training material, are subject to continuous updates based on defects, changes, or other decisions that impact system functionality. For artifacts that require or are subject to continuous updates, the project CRM repository will be used to maintain an ongoing record of a particular artifact, along with an attached version of that artifact. This approach allows for creating sustainable documents while retaining the integrity of approved deliverables. For example:

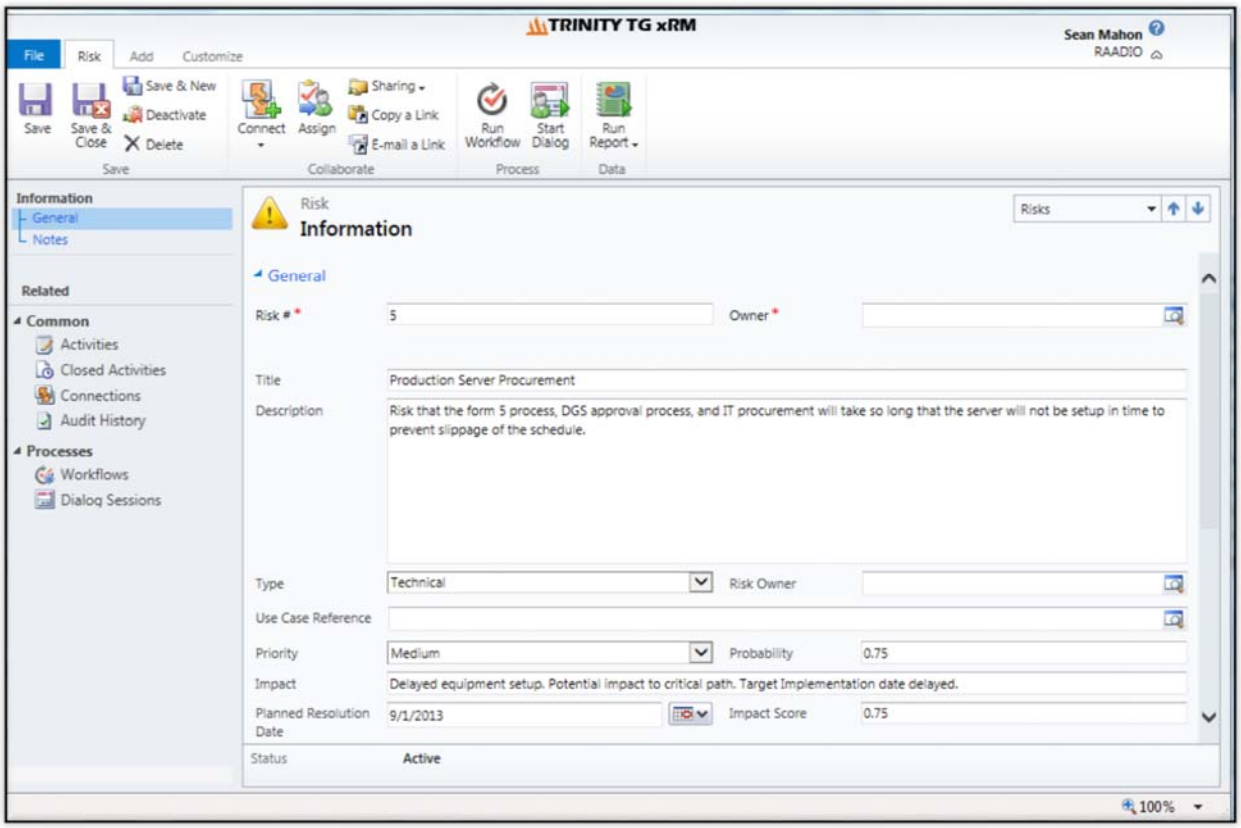
- The Detailed System Design will have a logical data model. The logical data model will be part of the final submitted deliverable and will remain in that deliverable as a representation of work completed

However, the corresponding Visio diagram for the logical data model will exist as a separate artifact, and incremental updates will be tracked and stored in the CRM project repository for ongoing reference.

Risk Management Plan

The Risk Management Plan includes processes by which potential threats to project success are identified, mitigated, or eliminated. It is the potential that distinguishes a risk from an issue – an issue is logged for an actual threat to project success. Risk considerations will include technical, management, solicitation and contracting, performance, budget resources, political, natural disasters, security etc. Risk management is an integral part of project management from project initiation through project completion. The project will follow the below process for managing risk:

Risk Identification: All identified risks need to be entered into the project's online risk register, as shown below:



Project Subject Matter Experts (Lead SMEs) will be primarily responsible for identifying and entering risks, however the Project Management team also has the discretion to input a risk. At the weekly risk review meeting, risks will be validated and qualified as a project risk, at which point it moves forward into the probability and impact scoring.

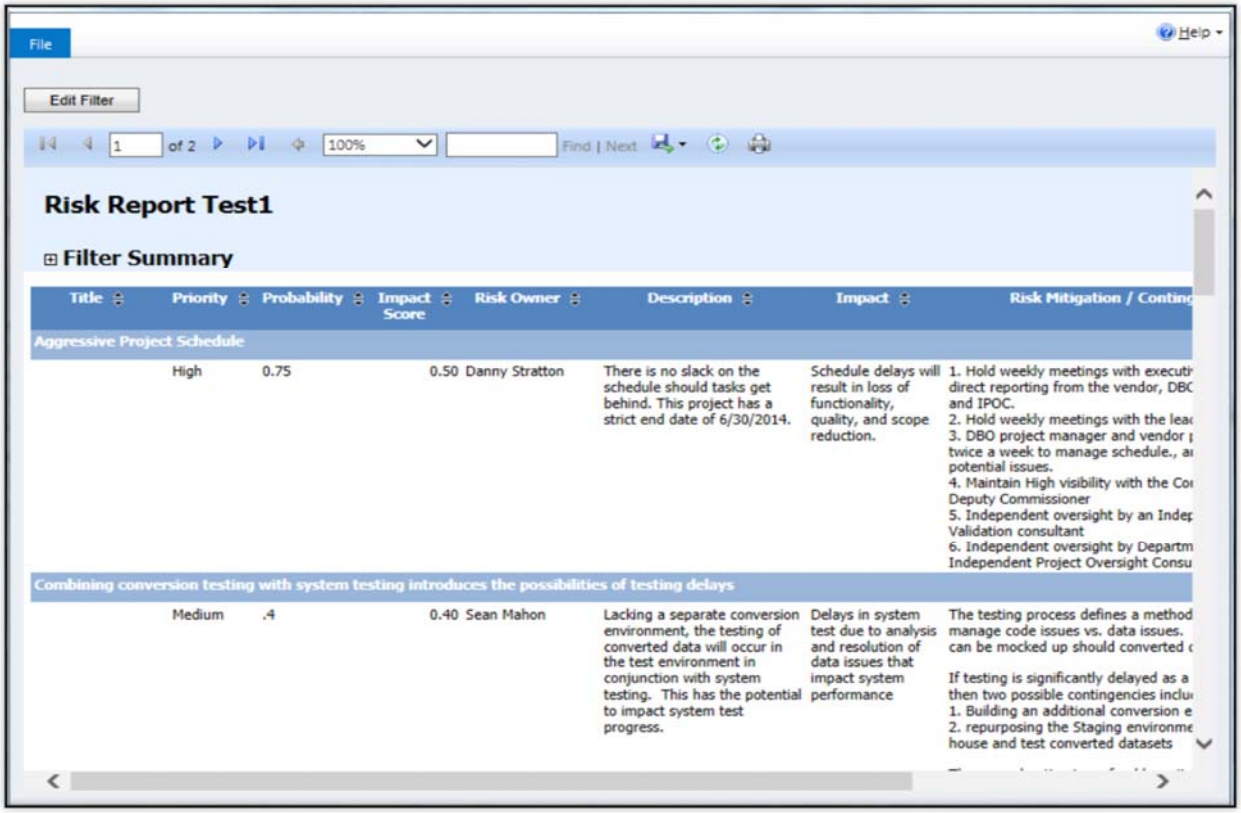
Identify Risk Probability and Impact: This step is critical to the successful management of risks as it identifies how likely the risk is to occur (Probability) and what the potential impact of that risk is if it does occur. Both of these items are rated on a 1-100% scale inside the Risk Register.

Prioritize Risks: Risks will be prioritized for discussion by the project management team according to their risk score. The risk score is calculated by multiplying the probability of occurrence by impact.

Identify Risk Mitigation Strategy: This process allows us to identify actions that can be taken to reduce the overall risk score of a risk, by reducing the risk score you reduce the overall impact to the project should the risk actually occur. It is important to update the Probability and Impact scores after a risk mitigation strategy has been put in place as this risk will now likely have a revised score and may require less attention.

Risk Contingency Plans: A risk contingency plan is an actionable plan that can be executed should a risk occur. This often involves assigning individuals to be the owner of the risk contingency plan. By planning for risks to actually happen the overall impact of the risk can be reduced.

Risk Monitoring: Risks must be monitored on a consistent basis. It will be the responsibility of the project management team to review risks as part of their weekly status meetings, however risk monitoring is not the sole responsibility of the PM group, but it is the responsibility of everyone on the project to watch for evolving risks. Risk register logs can be accessed either directly through the CRM repository, or they can be downloaded and printed to an excel spreadsheet for reference by individuals who do not have direct access, as shown in the following report:



File Help

Edit Filter

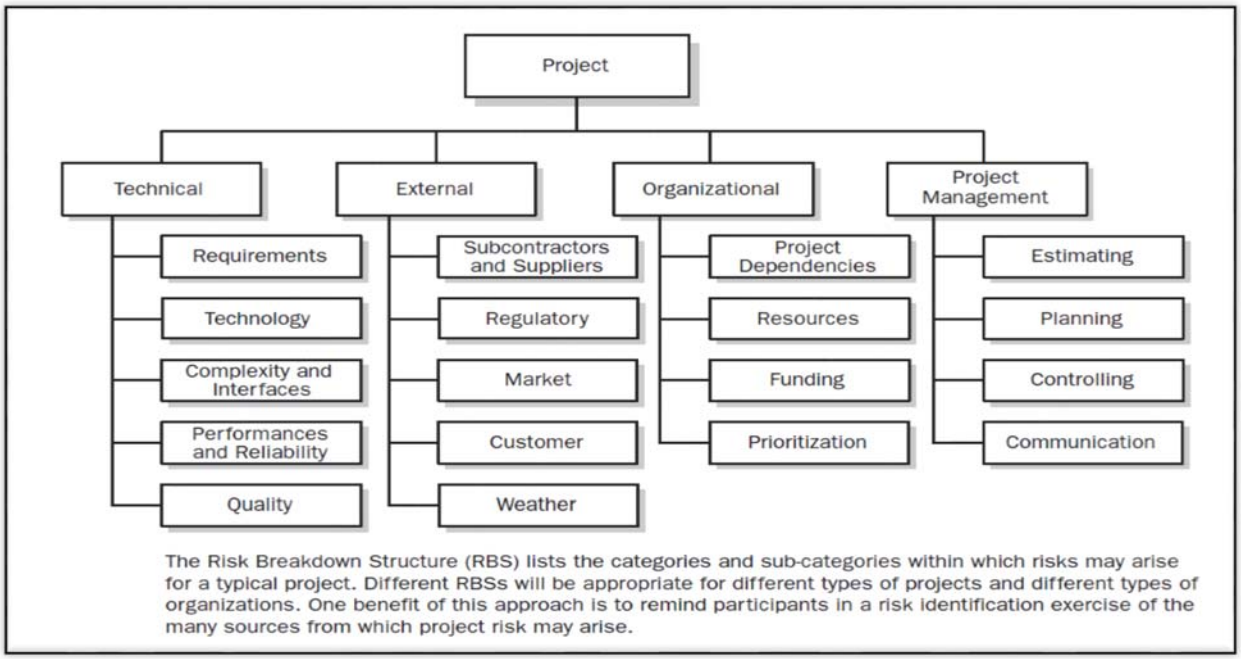
1 of 2 100% Find | Next

Risk Report Test1

Filter Summary

Title	Priority	Probability	Impact Score	Risk Owner	Description	Impact	Risk Mitigation / Contin
Aggressive Project Schedule							
	High	0.75	0.50	Danny Stratton	There is no slack on the schedule should tasks get behind. This project has a strict end date of 6/30/2014.	Schedule delays will result in loss of functionality, quality, and scope reduction.	1. Hold weekly meetings with executi direct reporting from the vendor, DBC and IPOC. 2. Hold weekly meetings with the lea 3. DBO project manager and vendor p twice a week to manage schedule., a potential issues. 4. Maintain High visibility with the Co Deputy Commissioner 5. Independent oversight by an Indep Validation consultant 6. Independent oversight by Departm Independent Project Oversight Consu
Combining conversion testing with system testing introduces the possibilities of testing delays							
	Medium	.4	0.40	Sean Mahon	Lacking a separate conversion environment, the testing of converted data will occur in the test environment in conjunction with system testing. This has the potential to impact system test progress.	Delays in system test due to analysis and resolution of data issues that impact system performance	The testing process defines a method manage code issues vs. data issues. can be mocked up should converted c If testing is significantly delayed as a then two possible contingencies inclu 1. Building an additional conversion e 2. repurposing the Staging environme house and test converted datasets

The following risk breakdown structure will be used to categorize risks:



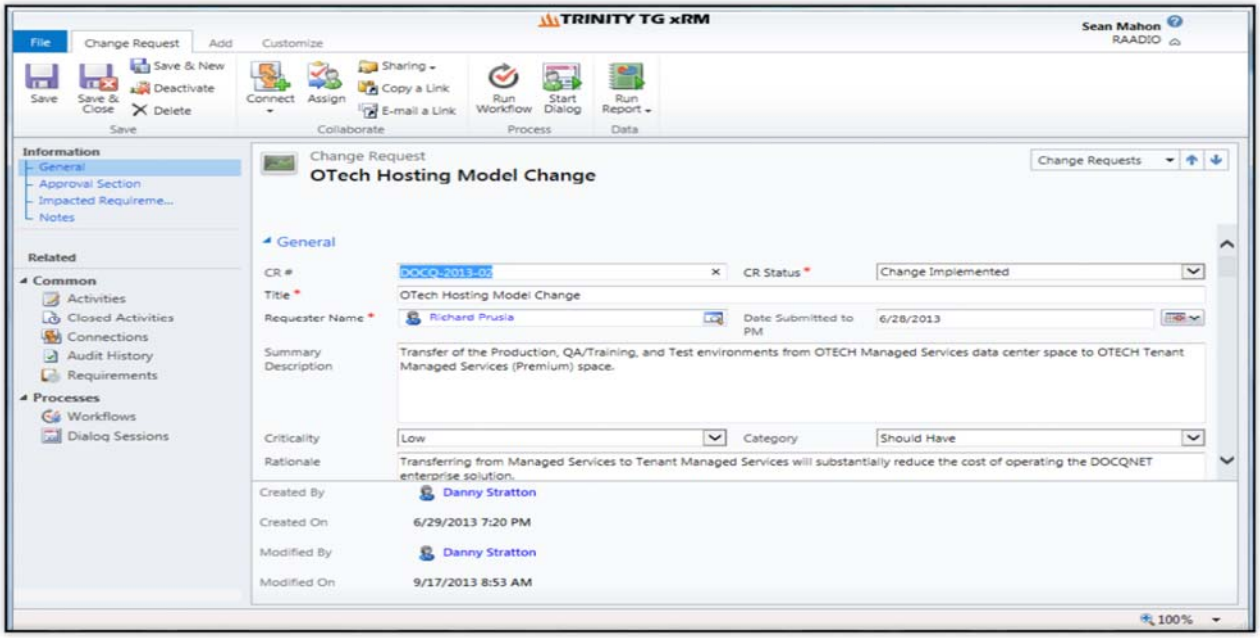
The Risk Breakdown Structure (RBS) lists the categories and sub-categories within which risks may arise for a typical project. Different RBSs will be appropriate for different types of projects and different types of organizations. One benefit of this approach is to remind participants in a risk identification exercise of the many sources from which project risk may arise.

Change Control Plan

The Change Control Management Plan will dictate how changes will be monitored and controlled within the project. For the purposes of this document the change control plan will also dictate how the project will perform the integrated change control function.

Change Initiation

Changes may be requested by any stakeholder who is involved in the project. This request must be made to one of the members of the Project Management Team (the CEC Project Manager, and TTG Project Lead). The Project Management Team will be responsible for first validating that this request is indeed a change, and then inputting the change into the change request register in the CRM repository. This register will maintain a list of all requests for change and will also contain the status of that change and who is currently reviewing that change:



Submitted changes are assigned to a Lead SME to provide a detailed description of the change (e.g. new requirement, change in functionality, etc. Once the description is completed the change is assigned to a TTG Functional Lead to conduct a detailed impact analysis and effort estimate.

Change Approval

On a weekly basis the project management team will conduct a change control meeting to review the change control log, which is available electronically in the CRM repository, but can be exported to a spreadsheet for review if needed. The purpose of this meeting is to review the current status of all changes and determine if any changes are ready to move into the approval process.

All changes need to be either approved or rejected. The level of approval varies based upon the impact of the change. Lower impact changes can be approved more expediently, whereas higher impact changes escalate to a larger approval authority. The following table defines three existing project committee who will be part of the change control approval process.

Approval Group	Composition
Executive Steering Committee	The Executive Steering Committee includes all Project Steering Committee members, along with Deputy Commissioners from each of the divisions.
Change Control Board	The Change Control Board includes all of the Project Management Team, along with the Lead Subject Matter Experts (SMEs) designated for the project

Project Management Team	The Project Management Team consists of the CEC Project Sponsor, CEC Project Manager, TTG Project Manager.

A change will be approved by a particular approval group based on its impact. The following table provides three dimensions of change factors (Scope, Schedule, and Cost) and defines the thresholds amongst three groups of approvers.

Approval Group	Scope	Schedule	Cost
Executive Steering Committee	Changes that impact more than one business division	Impacts that increase the critical path timeline and as a result impact a critical business timeframe	Cost impacts in excess of the unanticipated hours reserve
Change Control Board	Changes that add to or significantly impact the baseline requirements or design of SSR	Impacts that increase the critical path timeline	Impact to and/or use of the unanticipated tasks reserve
Project Management Team	• Changes to required content/format of deliverables • Changes to reduce scope and/or requirements	No impact to the critical path, or reduction of critical path	No net cost impact

If a change's impact falls into different threshold levels, the approval will come from the authority defined at the highest threshold level for that particular change.

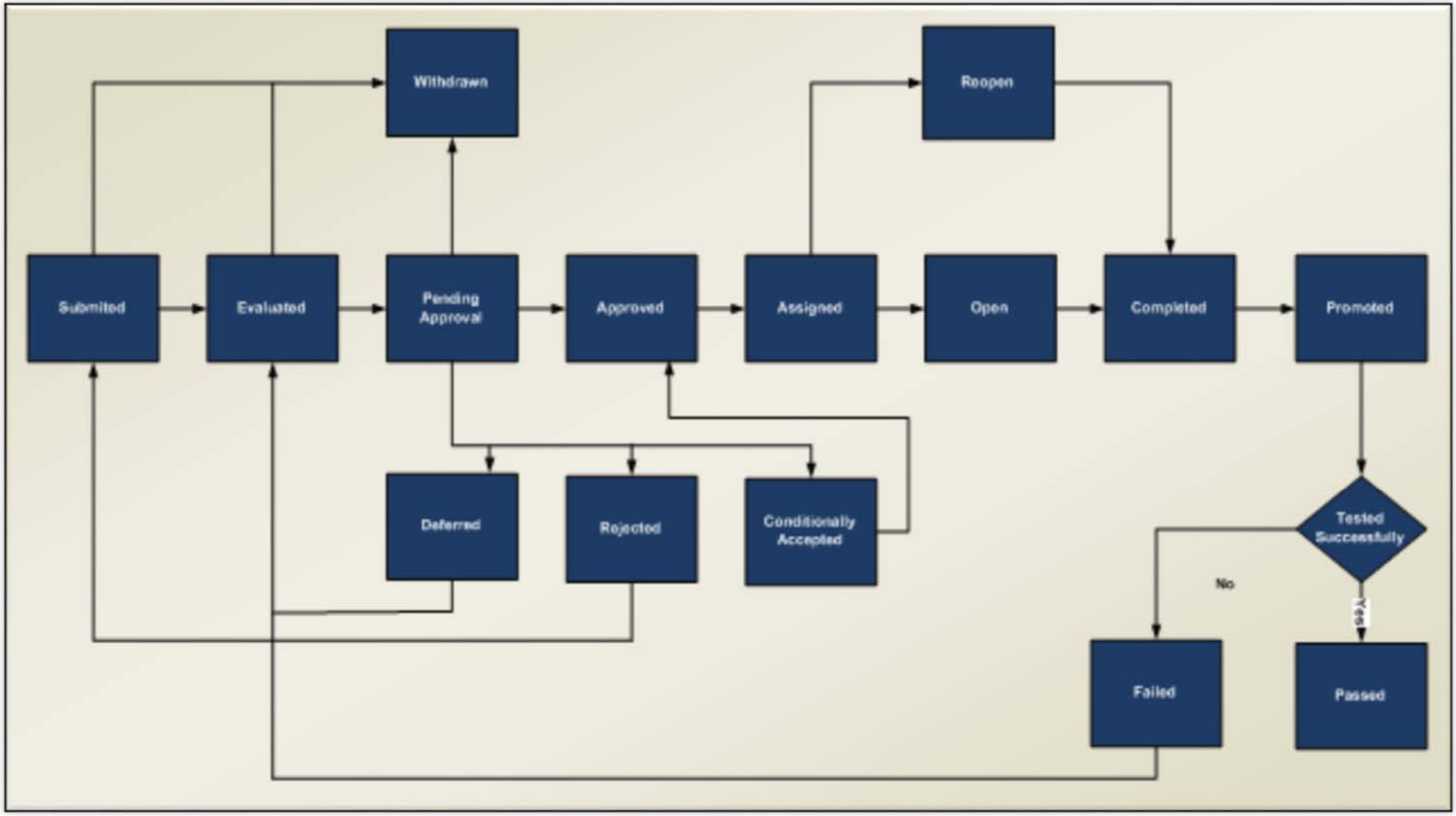
Change Control Form

The following template will be used to document changes. A subset of the fields captured in the change control form will be captured in the CRM repository for tracking purposes.

Requester Name :	
Date Submitted to PM:	
Summary Description:	
Criticality:	☐ High ☐ Medium ☐ Low
Category:	☐ Must Have ☐ Should Have ☐ Nice to Have Rationale:
Benefits:	
Reason(s) for Change:	☐ 1=Consistent with Project Objectives, Scope and Vision ☐ 2=Necessitated by a Change in Law, Statute, Federal Requirements, etc. ☐ 3=Compelling Business Need ☐ 4=Vendor Requested ☐ 5=Requirement Change
Analysis	
Cost Impact	
Schedule Impact	
Resource Availability	
Risk Impact	
Quality Impact	
Additional Information	
Attachments	☐ Yes ☐ No
	ink: None
PM Recommendation:	
CCB ☐ Approve Date: M/DD/YY ☐ Disapprove Date: M/DD/YY ☐ Escalate Date: M/DD/YY	
Project Sponsors ☐ Approve Date: M/DD/YY ☐ Disapprove Date: M/DD/YY ☐ Escalate Date: M/DD/YY	
Steering Committee ☐ Approve Date: M/DD/YY ☐ Disapprove Date: M/DD/YY	

Change Control Workflow

The change control workflow is displayed in the following flowchart. This workflow includes high level steps to also track the change's implementation.



Post Decision

After a decision is made there are various things that need to happen. If a change is rejected then the change initiator needs to be notified via the change request register. If a change is deferred, then the change initiator is notified of the preliminary timeframe/phase for when the change will be reassessed. If a change is approved there are a variety of other actions which need to be performed including potential updates to:

- Cost Estimates
- Activity Sequences
- Schedule Dates
- Resource requirements
- Analysis of risk response alternatives
- Updates to project management plan and/or sub-plans
- Other project documents

Communications Management Plan

A key to successful project management is the presence of timely, accurate, and understandable communication. It is important to incorporate information from each activity and team member so that detail and summary information will be available to the SSR project stakeholders.

Project Stakeholder Identification

The following table summarizes the major stakeholders related to the project:

Stakeholder Group	Members
Executive Steering Committee (PSC)	Executive Sponsor Executive Steering Committee Program Manager
Project Management Team	CEC Project Manager TrinityTG Project Lead
Subject Matter Experts (SMEs)	Business Team Technical Team

Communications Flow

The Project Steering Committee (PSC) is responsible for defining and communicating the Project objectives and direction. The Project Management Team is responsible for ensuring the project meets the goals and objectives of the Steering Committee. The Project Management Team is also responsible for ensuring the project status and results are communicated to the PSC. The Project team is responsible for reporting status, issues and risks.

The project has established several forms of verbal and written communication to ensure stakeholders, sponsors, executive management, team members, internal divisions, and vendors involved in the project have a clear understanding of the project. The formal communications are outlined in the following matrix:

Communications Matrix

	Information (What)	Purpose (Why)	Stakeholder Audience (To Whom)	Frequency (When)	Format (How)	Responsibility (From Whom)
02	Project Status Meeting	Review Project Status on: tasks completed/ delayed, two week look-ahead, resources, risks/issues, etc.	Project Management Team	Weekly	Meeting	TrinityTG Project Manager
03	Monthly Steering Committee	Project Guidance, overall progress, and messaging	Executive Steering Committee	Monthly	Meeting	CEC Project Manager, TrinityTG Project Manager
04	Functional Design Deliverable Reviews/Walk-throughs	Share design and functionality approaches with business users	Project Management Team, Subject Matter Experts	As scheduled	Meeting	TrinityTG Functional Leads
05	Technical Design Deliverable Reviews/Walk-throughs	Share design and functionality approaches with business users	Project Management Team, IT SMEs	As scheduled	Meeting	TrinityTG Technical Lead
06	Risk & Issue Review	Review Risk & Issues	Project Management Team, Subject Matter Experts	Weekly	Meeting	CEC Project Manager
07	Traceability Reconciliation Review	Reconcile requirements with deliverables	Project Management Team	As Defined in the Baseline Schedule	Meeting	TrinityTG Project Manager
08	Change Control Review	Discuss formal change requests to the project	Change Control Board	Weekly	Meeting	CDE Contract Manager

It is important to note that automation projects typically require ad hoc meetings on a range of topics. Given the competing demands on time on all those requested to participate in these ad hoc meetings, certain practices can reduce the level of effort, schedule changes, and enhance the outcomes. These practices include:

- Conference Calls
- Email strings;
- Microsoft Lync and/or Webex Meetings;
- In-person meetings.

To the greatest extent practical, all such meetings should have a defined agenda that includes the requested participants, agenda topics, prior preparation, and expected outcomes. The person who

calls the meeting shall prepare a summary of the key topics addressed, outcomes, and assignments made.

As a result of a meeting, email, or verbal interaction any decision made that establishes or impacts project standards or commitments shall be documented and recorded appropriately.

Configuration Management

The development of MAEDBS will be carried out in an iterative process, moving towards some end goals or milestones in the form of a release, either unit testing or to deploy a build for test, staging, or production servers. Configuration and release management is the process of ensuring releases can be reliably planned, scheduled and successfully transitioned (deployed) to test, staging, and production environments. This section of this document defines the practices that will be adhered for successful management of software versions and builds.

The following table describes the methodologies that will be adopted

Terms	Description	What will be done for MAEDBS
Release	A stable, executable version of the System that can be deployed to production	A release is considered completed once UAT has been completed. The release number will be four numbers separated by dots.
Release Package	A logical container that holds the all component releases	A package will consist of a the code artifacts that comprise the solution
Release Type	The type of release that needs to be implemented	MAEDBS will have the following types of release(s): **Major**: Major releases are defined as releases that include new functionality. **Minor:** Minor releases are defined as releases that include fixes to defects or incremental updates to existing functionality.
Release Policy	Organization's published policy that defines under which circumstances different release types should be published	CEC's release policy will be based on the release management terms and methodologies defined in this section.
Release Calendar	A set of Published milestone details describing when releases are planned to be made	MAEDBS' project management plan will be used to manage major releases through Phase 1 of the project.
Baseline	A snapshot of the exact version of configuration items, executable, libraries, configuration files and documentation that are to be deployed	Each release that will be deployed to staging or production will be a base line release
Builds	Builds are operational versions of the system, not all builds become releases	MAEDBS will have builds for unit test.

Configuration Artifacts

The following table presents the software artifacts that are most commonly included in a typical web-based .NET solution:

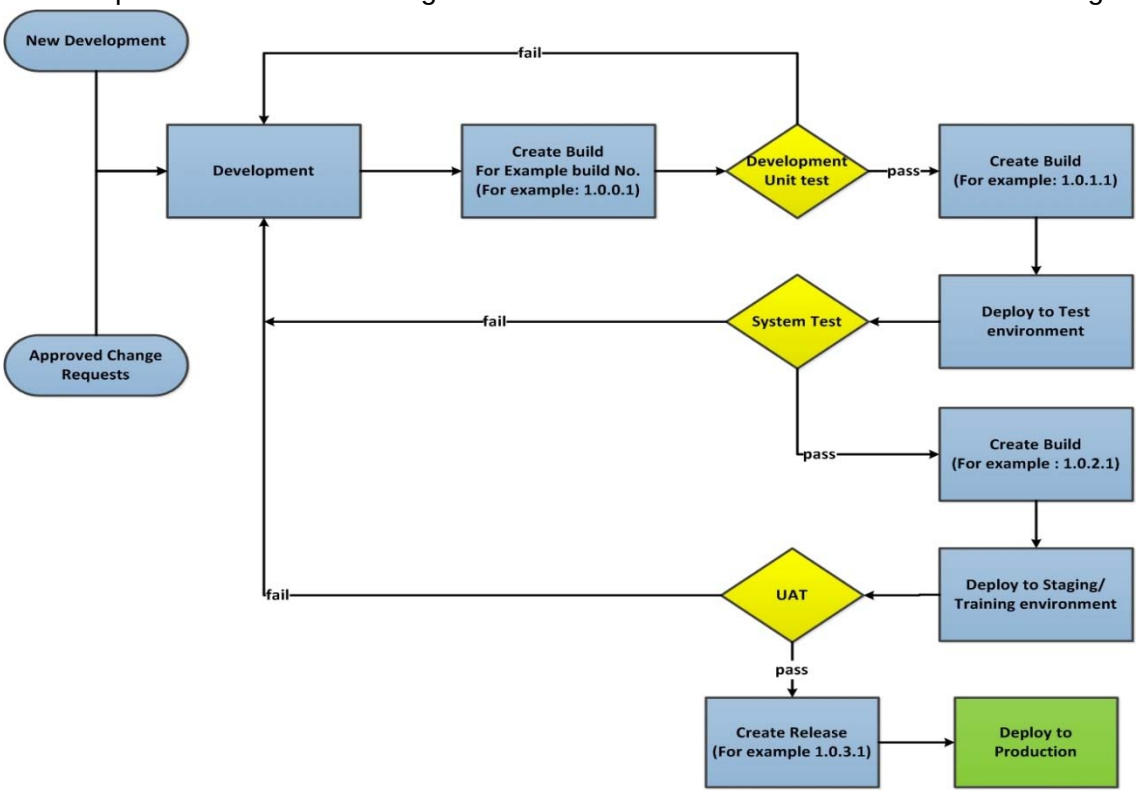
Folders/Files	Descriptions
Anonymous	This folder contains the web pages that should be accessible to the end user without authentication, for example CreateUserProfile.aspx, ForgotPassword.aspx etc.
App_Code	This folder contains static C# classes like AppWorkFlow.cs etc.
App_ GlobalResources	This folder contains the resource file for storing the error messages that can be generated by the website. This folder is also used to keep language files other than English. DOCQNET system's self-service app will only support the English language.
App_Themes	This folder contains the cascading style sheets, images, etc. for the website.
Bin	This folder contains the runtimes required by the website to perform its functions.
MasterPages	This folder contains the ASP master pages for the Self Service App website.
User Controls	This folder contains user controls that have been used in the .aspx pages throughout the website. These user controls are custom controls built only for the self-service app. For example, a custom grid to display the data can be converted to a control and used in various pages in the website without recreating the custom grid in each web page.
Default.aspx	This is the startup page for the website
Scripts	This folder will contain the JavaScript files used for customization of the user interface for the self-service app. These are client-side scripts for web pages.
WebPages	This folder contains all web pages (aspx).
Global.asax	This file is also known as the ASP.NET application file, and is an optional file that contains code for responding to application-level and session-level events raised by ASP.NET or by HTTP modules

Web.config	All the configuration settings. Configuration settings of the website are kept in the web.config file. Example of Web.config,
	`<!-- This is folder on the server where website is deployed. This is used for storing documents related to given quarter-->`
	`<add key="LocalDocumentFolder" value=""/>`
	`<add key="ApplicationVersion" value="1.1.1.1"/>`
	`<add key="Application_Code" value="DOCQNET"/>`
	`<add key="Application_Id" value="24"/>`
	`<add key="IsLoggingEnabled" value="Yes"/>`
	`<add key="ExLogFile" value="App_Data\Trace.txt"/>`
	`<add key="tsHrs" value="0"/>`
	`<add key="tsMin" value="10"/>`
	`<add key="tsSec" value="90"/>`
	`<!-- EndPoint for the Service if you plan to use BasicHttpBinding-->`

	<add key="basicHttpEndpoint" value="http://xxxxx/basicHttpBinding"/> <!-- EndPoint for the Account Management WCF Service if you plan to use ws2007HttpBinding--> <add key="ws2007HttpEndpoint" value="http://xxxxxxws2007/HttpBinding"/> <!-- Can be one of the following values : basicHttpBinding or ws2007httpBinding --> <add key="CurrentServiceBinding" value="ws2007httpBinding"/> <!--EndPoint for the CASGEM WCF Service if you plan to use BasicHttpBinding--> <add key="cgCurrentServiceBinding" value="ws2007httpBinding"/> <add key="LastModifiedApplicationDate" value="05/02/2013"/> <add key="WebsiteHostName" value=" "/> <add key="DataKey" value="1"/> <add key="HomeScreenImportantText" value="Welcome to Department of Business Oversight's Self Registration Website"/>
Authentication	This folder contains the web pages related to the user account management.

Software Versioning and Releases

An example of how version management will be controlled is illustrated in the below diagram.



Configuration Management Practices and Principles

1 Regular and targeted release dates will be defined through a release calendar.

2 Back out plan; for example the releases that are deployed at the production and staging environments will have a back-up version in Visual Studio. If a tested release is deployed on production and subsequently problems are found, there will be a process to roll back to the last good version deployed.

3 The Development team will deploy the builds on the development environment for unit testing and on the test environment for system testing.
4 Deployment and distribution to the Staging and Production environments will be carried out by a team of administrators who are independent of the development team.
5 Development will be carried out by multiple developers. The source code for MAEDBS will be kept in Visual Studio.
6 Visual Studio will have a root folder "MAEDBS," with corresponding sub-folders as shown below:

Main folder	Sub-folder	Description
MAEDBS	Web Resources	JavaScript, HTML, images, Silverlight components, style sheets, and icons.
	Images	Physical image locations
	Application	.NET Application source code
	Scripts	SQL Scripts used for extraction and loading of data
	Programs	C#.NET code used for custom data transformation
	Batch Scripts	Custom workflows, C#.NET Code

6 Each Development build for unit testing will increment the revision number. Revision number is the last number in the 4-number sequencing system: < Major Version Number>.< Minor Version Number>.< Build Number>.< Revision Number>. Each of these numbers will be version controlled within TFS.
7 Test deployment build numbers will be numbered as an incremental version of <Build Number>.
8 For Staging and production distribution, the release number will be incremental of 'Major build number' or 'Minor build Number' depending upon the type of release. The version number is four numbers separated by a decimal.
9 For Staging and production distribution, the release number will be an increment of 'Major build number' or 'Minor build Number' depending upon the type of release. The incremental build numbers will be maintained as shown in figure 6.
10 Development builds will be increments of the revision number. Once a development build is stable enough to pass through unit test, the build number will be increased. For example
- Development version 1.0.0.9 is stable and passed through unit test, the version that will be deployed to Test is 1.0.1.9.
- Version 1.0.8.56 is passed through system test and ready to be deployed at staging/training for UAT. The version that will be deployed at staging for UAT is 1.0.9.56.
- Version 1.0.12.82 has passed the staging and ready for production, version that will be deployed at production is 1.0.13.1098, where '1' is the major build,'0' minor build, '13' build number, '1098' revision number.

Approval Process

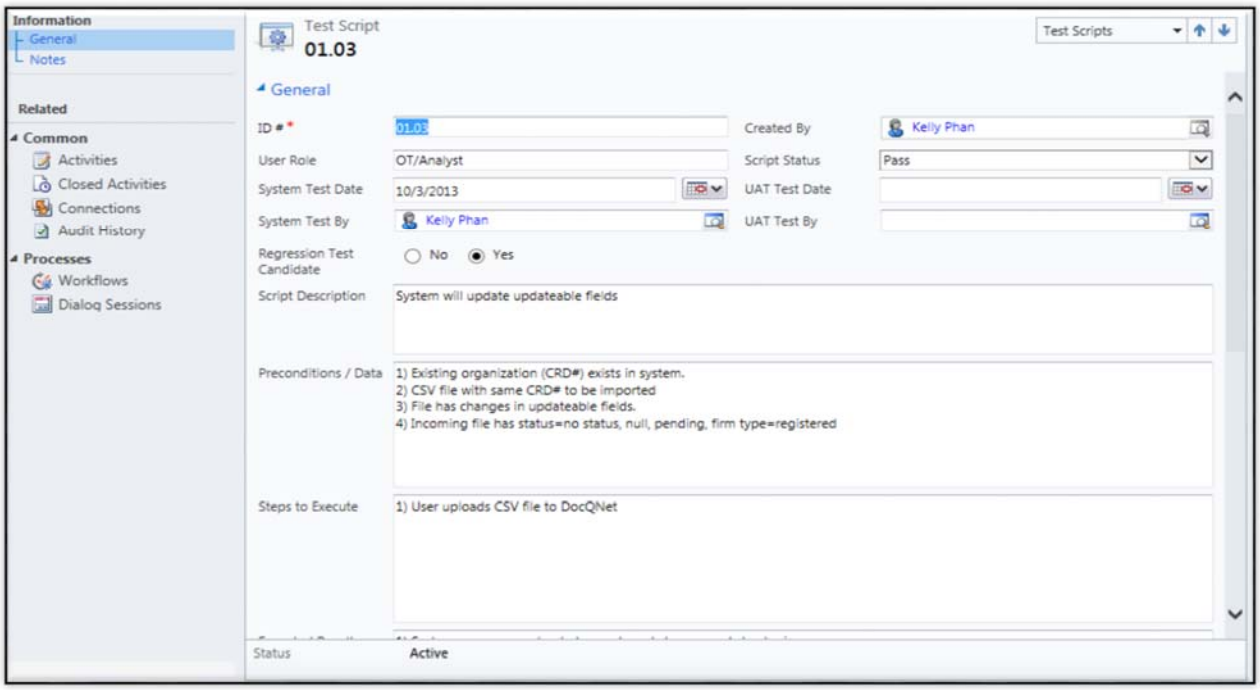
Each of the major releases has a series of tasks (such as go/no-go decisions) that are predecessors to confirming release readiness. The long term release management process will be defined as part

of the Maintenance Plan deliverable provided at a later stage in the project, and executed after Full System Acceptance.

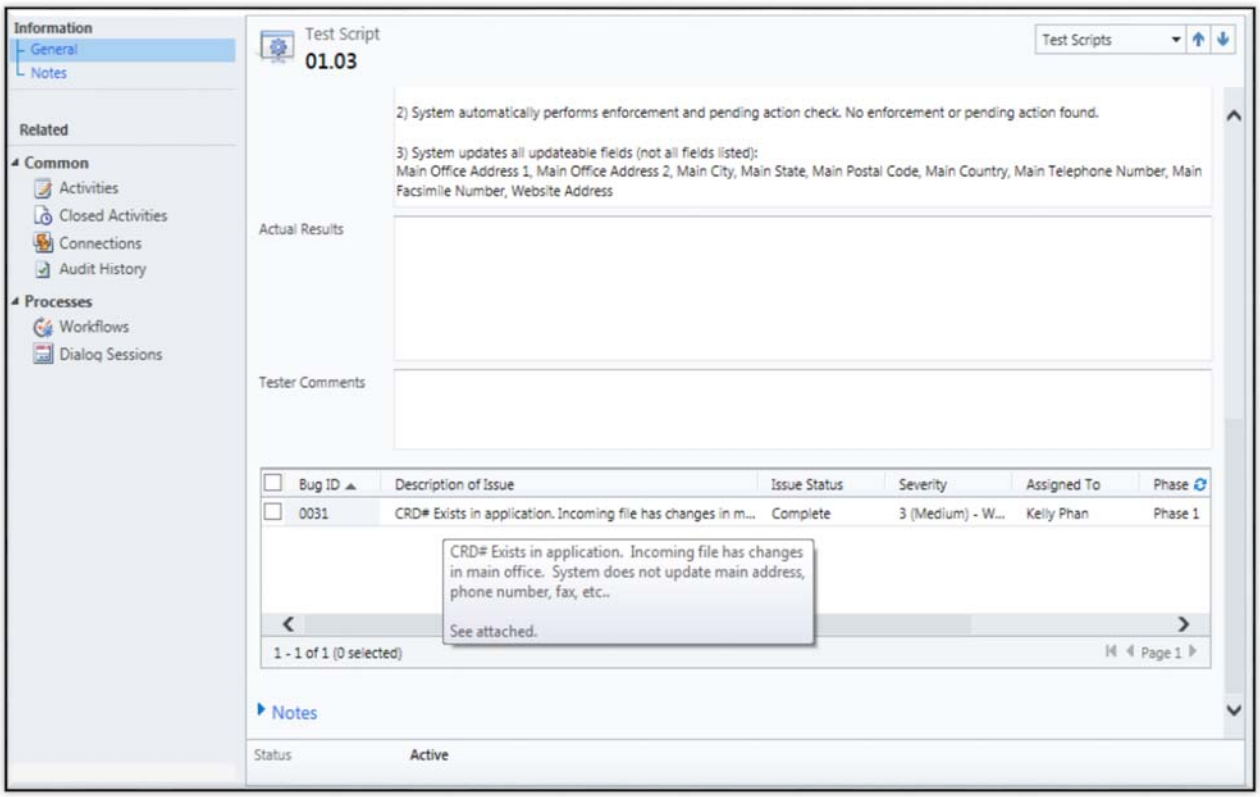
For minor releases that occur between the major releases dates, there will be a streamlined process for approval. The build will move through Development, Testing, and Staging based upon completion of Unit Test and System Test defect testing (or completion of script testing for changes). Once deployed to Staging, UAT is conducted by the Lead SMEs. UAT will consist of validating defect fixes, and/or validating that requested changes are functioning as required. Only those business divisions impacted by the build content will need to participate in UAT for a minor release. The completion of UAT signifies readiness for a build to move to Production. TrinityTG Technical Lead works with CEC IT staff to plan the deployment timeframe. This will depend upon the contents of the release and whether or not downtime is anticipated. Once the timeframe has been planned, the TrinityTG Project Lead presents the planned release date to the Project Sponsor (or designee) for final approval to deploy.

Defect Management Plan

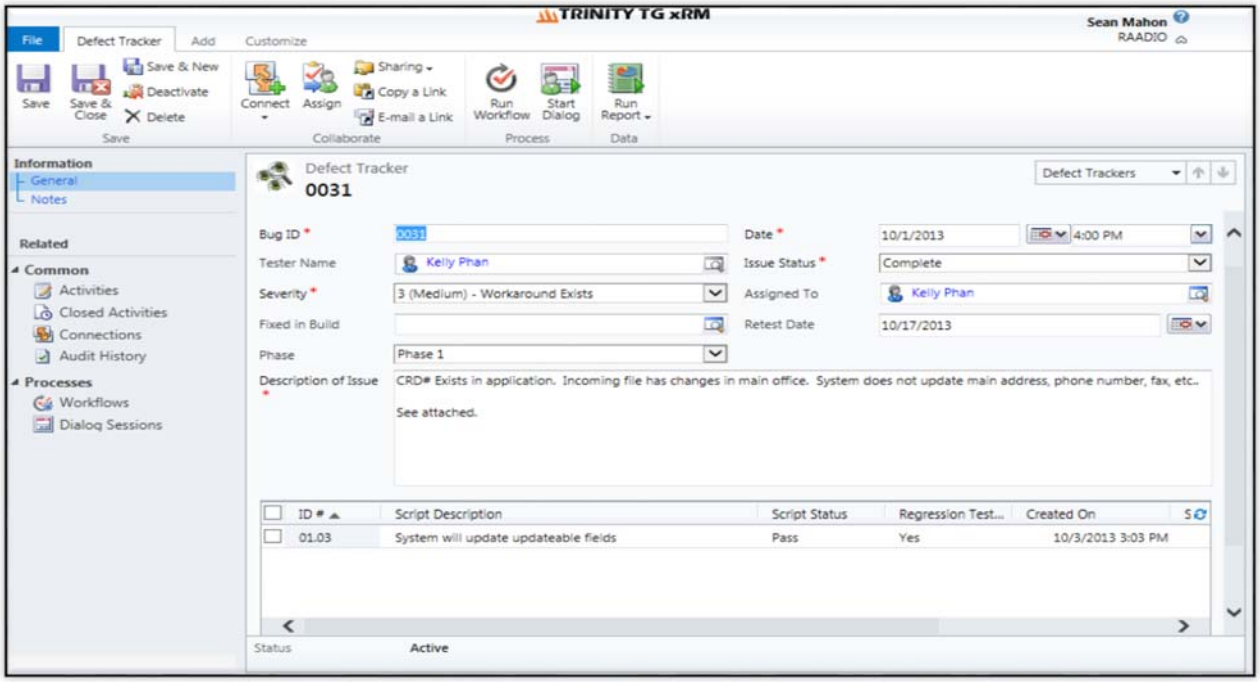
Our CRM-based project repository offers one of the most innovative approaches to defect tracking. As discussed in Section 5, our traceability approach drills down to the test script level - test scripts map to use cases, which cross reference to both process maps and requirements. The test scripts are therefore logged and tracked directly in the project repository as shown below:



Any defects found related to this test script are opened and logged in the project repository, as well. As shown in the grid view below, the defect is associated to the test script for traceability and reporting:



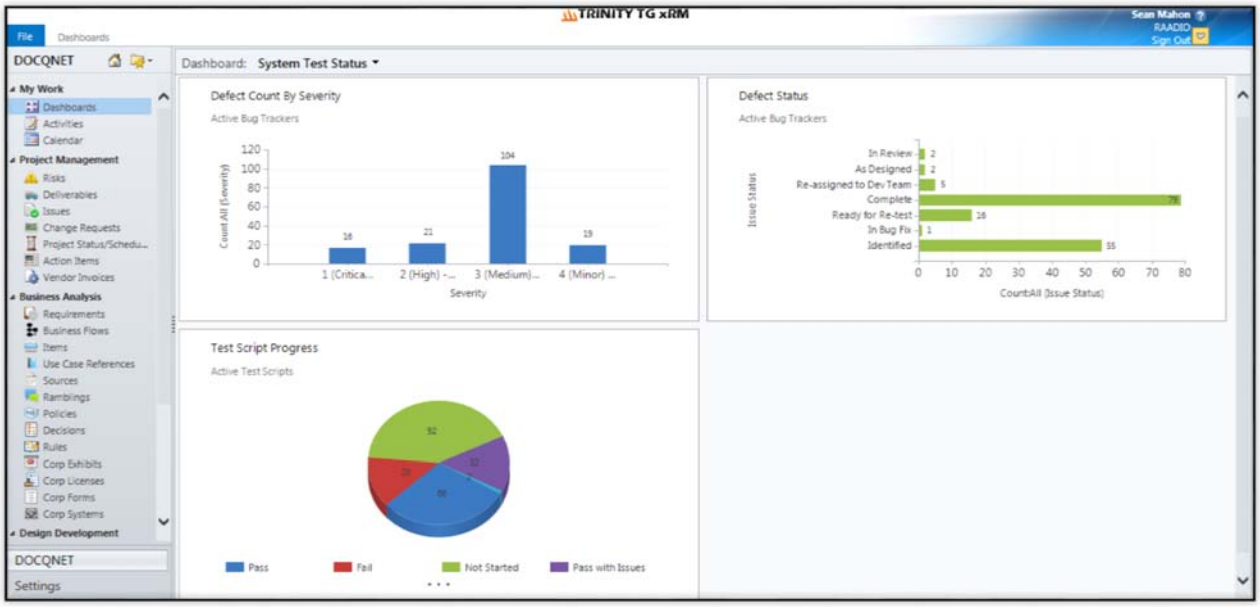
The defect tracker contains all of the categories and functions necessary for reporting, including date opened, status, severity, phase, retest date and assigned to. The traceability feature of our repository allows for a defect to show what script(s) are impacted by it, as shown below.



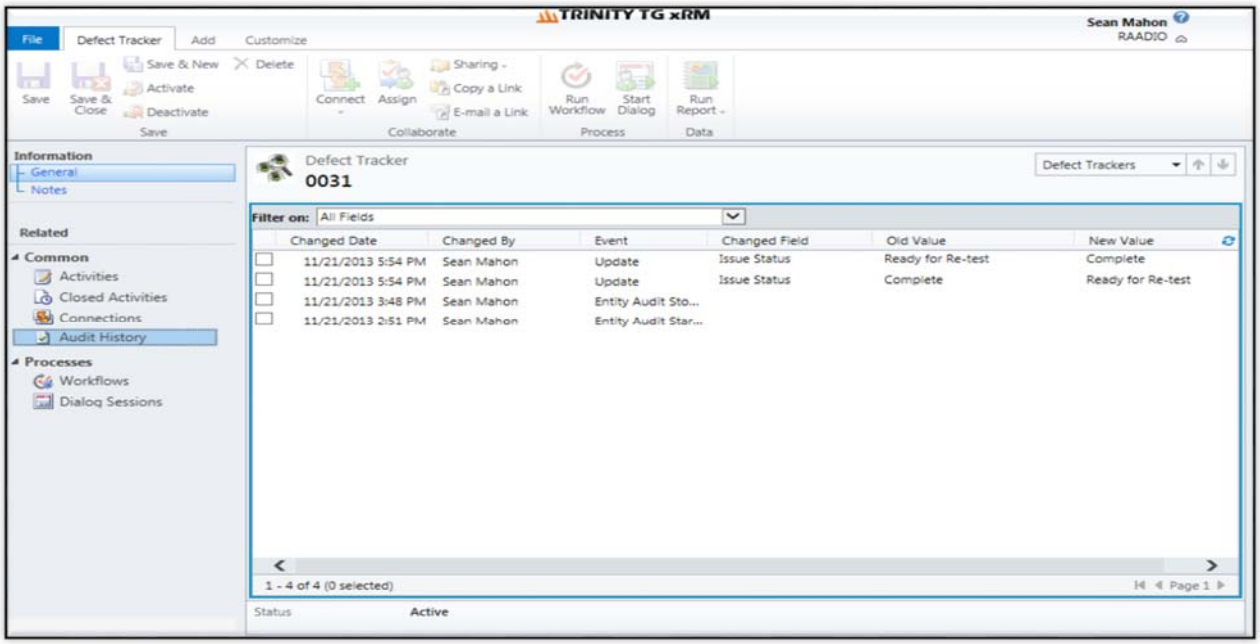
Both the defect status and testing status are aggregated on real-time dashboards that capture:

- Overall progress of test script execution – a pie chart demonstrates the relative number of defects in each status
- Defect count status – a summary of total defects in various states
- Defect severity status – a view of defect by severity, providing a "health" check based upon the volume of defects of a given severity

A sample of this dashboard is provided below:



One of the other features of the defect tracking repository is that the detailed history of all updates are tracked in a record level audit history. Who, what, when, and old/new values are captured for all users to see the progress on a given defect.



When a defect is found it is sent through an entire lifecycle where the defect is first reviewed, assigned, fixed and ultimately validated. The typical defect lifecycle is detailed below:

Status	Description
Not Started	This is the first state of an issue when it is documented. The lead will update it once a person is assigned.
Assigned	Assigned has many different entry points which illustrates that many people can assign issues back to this state.
In Bug Fix	This state is the analysis of what has happened during testing. There are three separate outcomes. The issue can be fixed, determined test data was a problem, or the application was determined to be functioning as it was designed.
Fixed	Once an issue is fixed it stays in this state until a build is deployed to the system testing environment. The development lead will set all issues in the fixed state to Ready for System Test when the build has been pushed out into the environment.
Ready for Sys Test	This state indicates the testers can retest the issues in the system test environment. If the problem is fixed, the issue state will be updated to complete. If it is not then the state can be changed back to Assigned.
Complete	Complete indicates there is nothing left to do with the issue that has been logged.
Test Data	A developer can determine the problem was incurred because of test data that was used in the execution of the script.
As Designed	This state indicates the system is functioning as it was designed. If the tester agrees it can move to Complete, but if they disagree it can be Assigned back to a developer.

Bi-weekly Status Reports

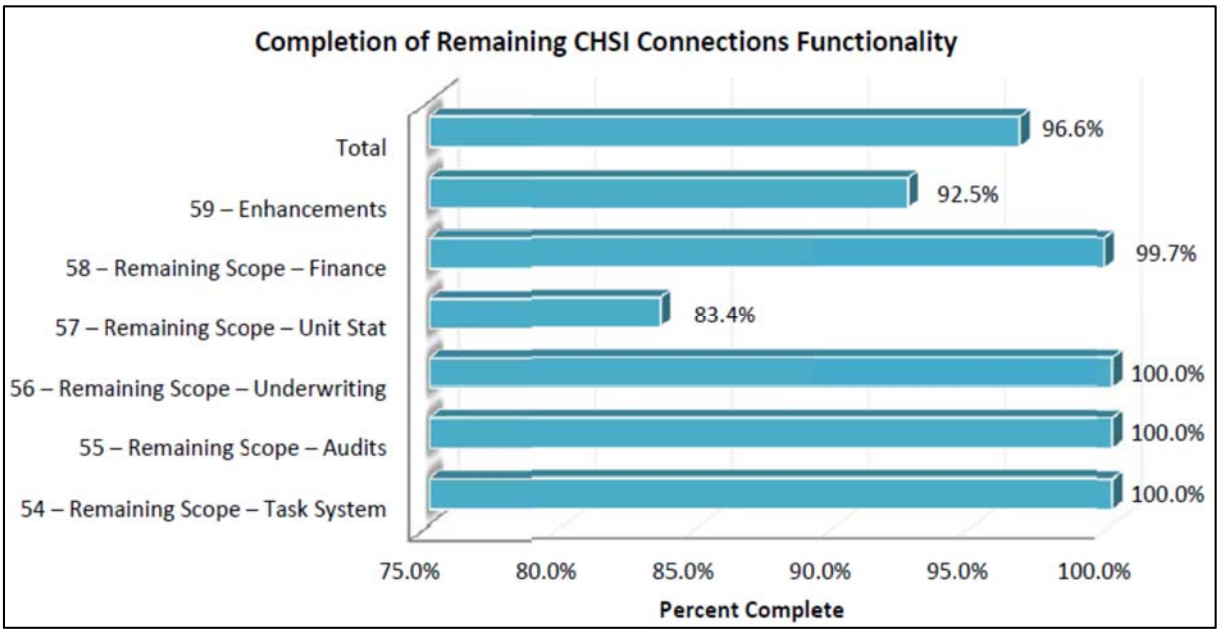
We provide status reports that include:

- The prior two week's activities.
- The success, continuation, failure or resolution of each prior week's activity.
- The activities planned for the next two weeks.
- Any issues or risks.

These reports may require the preparation of project overviews and more extensive use of graphics than normally applied to a weekly status meeting. The use of graphics is not to "dummy down" information but rather to attract attention to the project's importance, activities, choices, and value to the CEC. The status reports include visually-oriented graphs and tables to provide a summary view of project status. For example, the status reports include a dashboard that show the overall project progress by project monitoring area, as shown in the below example:

Project Item	Status	Trajectory	Notes
Schedule		↑	System Test 50% complete
Resources		↔	
Quality		↔	System Test Failure rate remains low
Risks		↔	Test Environment setup in progress; permissions items need resolution
Overall Project Status		↔	On Track

For quantifiable or countable statistics (i.e. testing progress, etc.), we provide graphical progress views for easy reference. A sample from a previous project is shown below:



Our project status reports also include updates on open issues, risks, changes, and other items that directly impact the schedule.

Project Schedule Updates

The Project Schedule will be maintained in an MS Project file, and will be available in the CRM Project repository for both CEC and TrinityTG staff to update.

Project Management Plan Updates

If the project structure requires a change to any of the process and procedures laid out in the PMP, then the TrinityTG Project Lead will provide updated versions of the plan that are incremented using the document management and versioning methodology outlined in the PMP.

Final Acceptance Document

The Final Acceptance document provided by the TrinityTG Project Lead includes the following information:

- Date of Acceptance – denoting the start date of production and end date of warranty
- Documentation Checklist – an inventory of all available documentation
- Knowledge Transfer session dates – documentation signifying completion of the proposed knowledge transfer sessions
- Outstanding Changes/Issues
- Lessons Learned Log

Requirements Document – Traceability Matrix

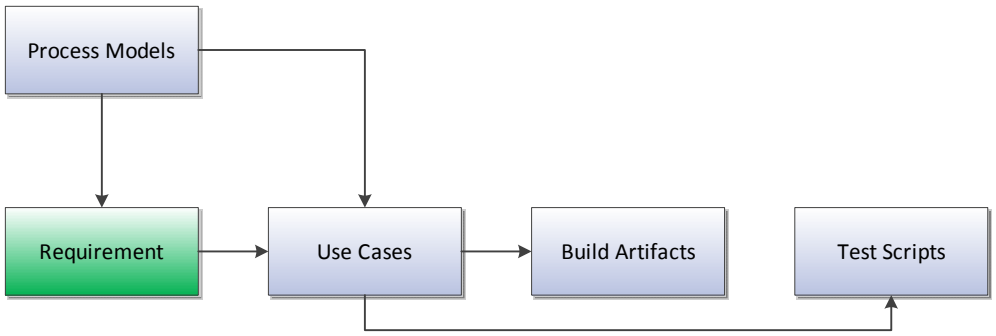
The Requirements Document includes information on both the validated requirements, as well as the traceability of those requirements to various project artifacts.

Traceability Management

Our approach to requirements traceability management revolves around the notion that requirements are not the sole indicator of how well the project is meeting the business need. Our approach to requirements management is to create and update a traceability matrix that places requirements within the context of process models and use cases – artifacts that more closely resemble actual business process. This approach has the benefit of dramatically reducing the risk that often occurs with requirements-driven implementation, which is the "build what was asked for, not what was needed" effect. Creating a set of functionality with no context for how that function fits within the business increases the risk that the functionality, while meeting the letter of the requirement, may not have the intended business impact. With our proposed approach, every requirement is run through a filter of determining how it relates to the business need, helping to ensure that:

1. Every requirement is understood in the proper context
2. Requirements that do not map to a business need are addressed early in the project before any effort is wasted on design, build, or test of an unnecessary requirement

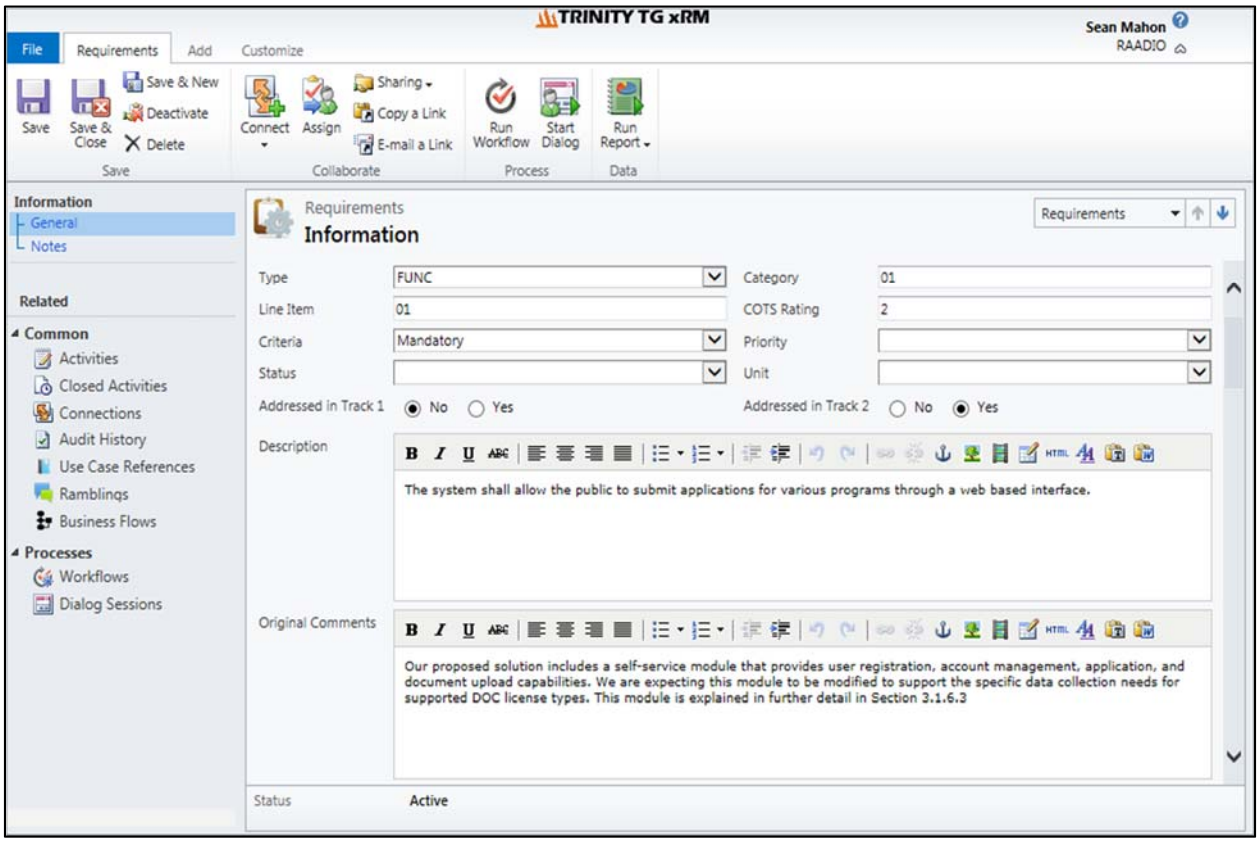
The following diagram illustrates the relationships we track relative to a requirement:



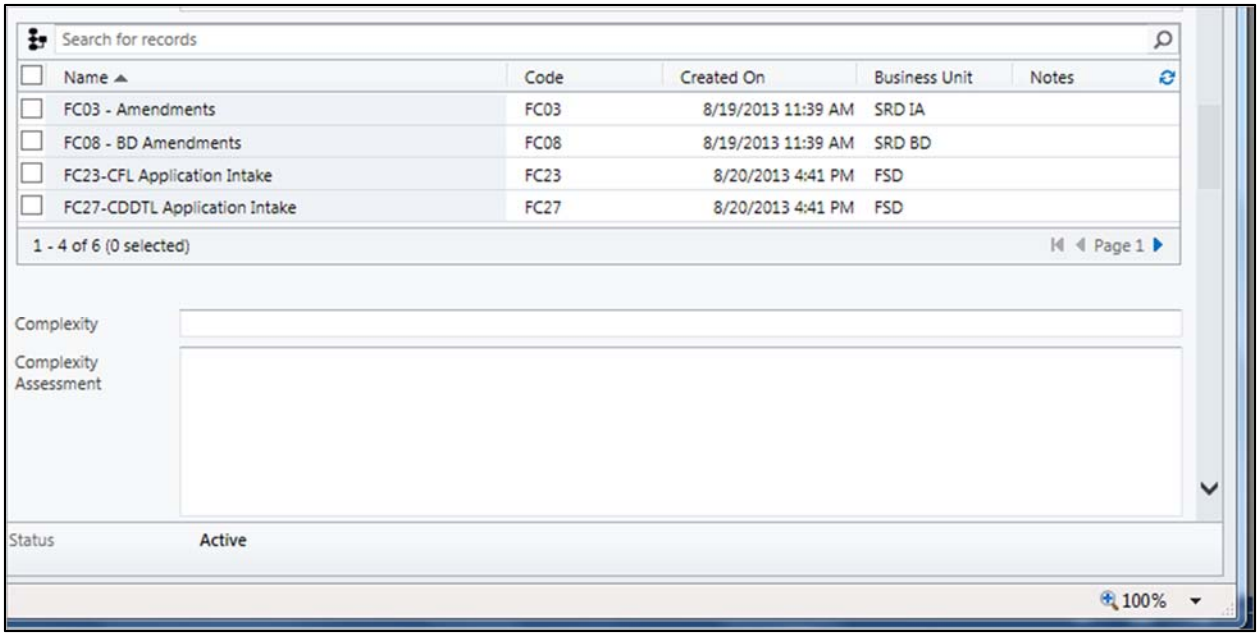
Key traceability relationships include:

- Use Case – Requirement: As noted in the Use Case Contents, the related requirements are mapped to all use cases. All requirements must be mapped to at least one use case to consider the use case inventory complete.
- Use Case – Process Model: Each use case is classified under the related process map. This helps to ensure that all business processes have been addressed, and also that no use case is outside the scope of the project.
- Use Case – Built Artifact: in System Design, we map the actual application components (screens, business layer components, etc.) to requirements to demonstrate a comprehensive solution.
- Use Case – Test Script: When creating scripts for System Testing, the test scripts are mapped back to a parent use case. This helps both Trinity and CEC staff understands what functionality is being tested, and that ALL functionality is being tested.

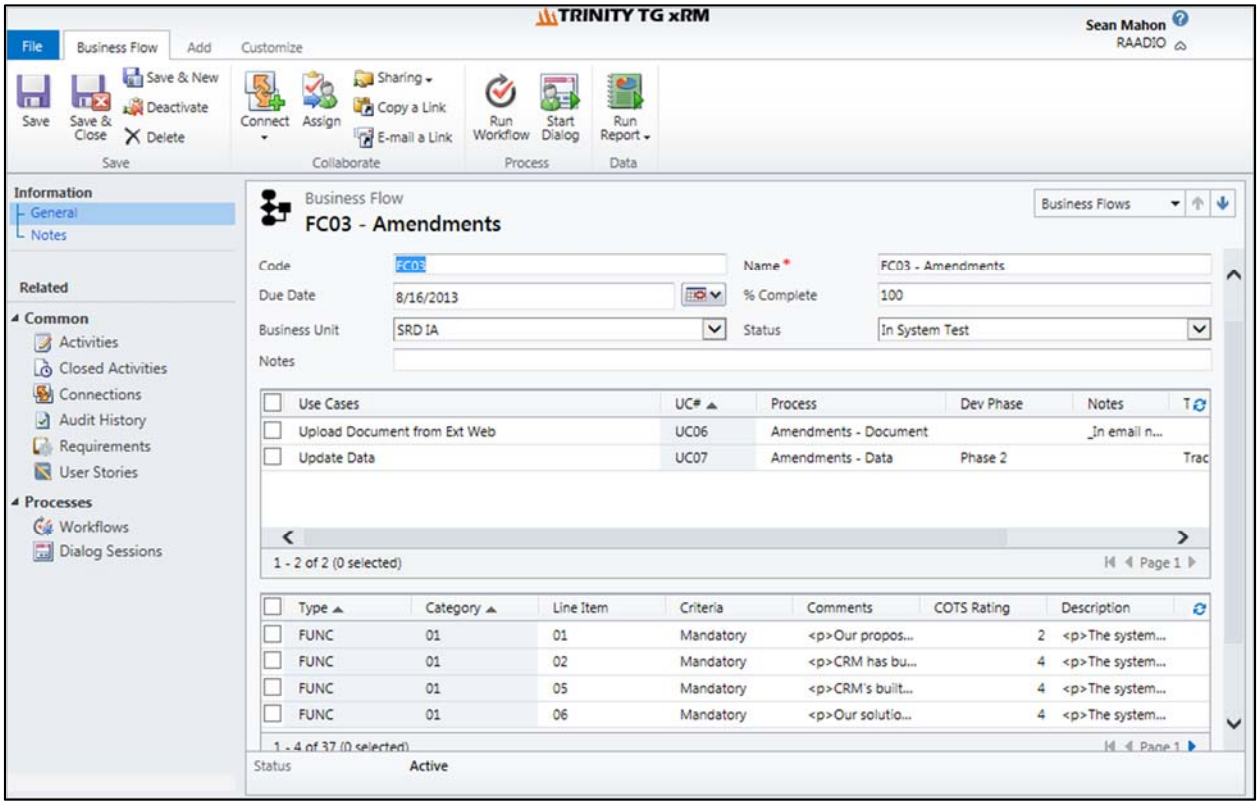
Each requirement is registered in the CRM-based project repository:



The original text of the requirement is captured, along with category indicators (e.g. Mandatory vs. Desirable, Functional category, etc.).

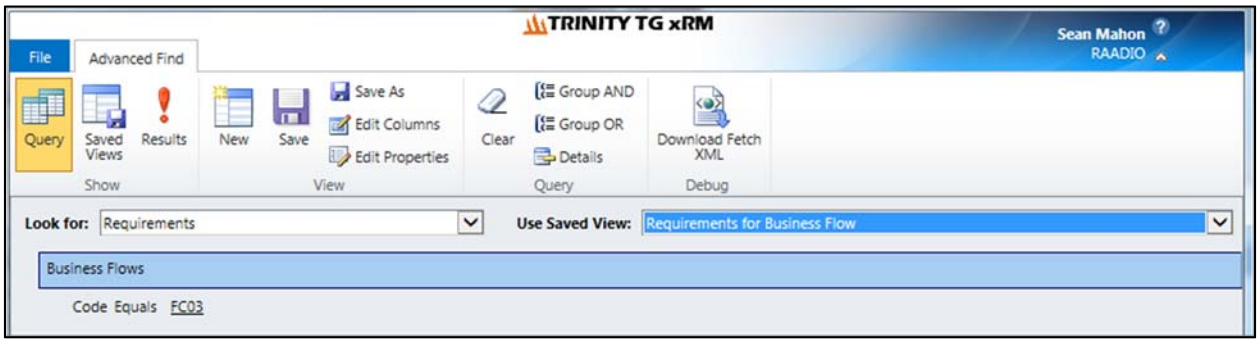


For each requirement, the tool tracks related records such as process models (shown above). When navigating to a related process model, the tool provides a snapshot view of all related requirements to that process model as well as related use cases.



This “many to many” relationship capability allows for advanced traceability reporting. As shown in the below screenshot, the project repository has a build in Advanced Find that allows users to

quickly run a query on a given requirement, and find related process models, use cases, or even test scripts:



Requirements Validation

During the analysis phase of the project, requirements are validated through a series of Validation sessions with the CEC staff. The objective of the validation sessions include:

- Confirming the comprehensive of process models and use cases
- Reviewing how and where requirements trace upwards to process models, and downwards to use cases
- Discussing how to address non-traceable requirements

One session is held for each category of requirement (e.g. Workflow, Security, etc.), where the proposed traceability for a given requirement is reviewed and updated.

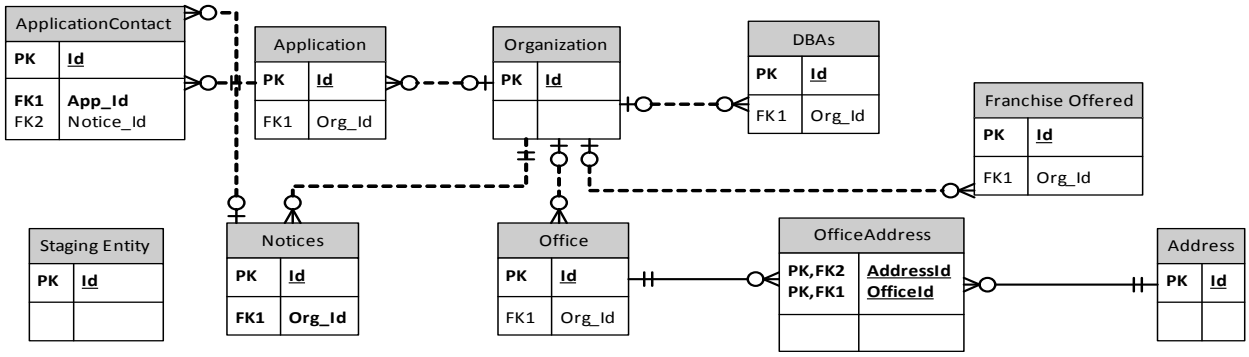
Because this effort is designed to validate a requirement's business value, any requirement that has not been mapped as a result of these sessions is a candidate for removal. Removal of a requirements is initiated by either the TTG or CEC Project Manager, and it is channeled through the Change Control process.

Using this information, we create the Requirements Document, which consists of:

- Process Models – our first analysis task is to create process models that outline the CEC's business process related to Appliance Efficiency management. This will be completed using the business requirements described in the RFO.
- Requirements Validation Inventory – each requirement is appended with updates or clarifications, and is then mapped to the process models to depict how functional/technical requirements relate to the business requirements. This mapping becomes the traceability matrix.
- Candidate Use Cases – Use Cases are identified based upon the process models and requirements in order to provide the outline for the functional specification that becomes part of the Detailed Design document.

Entity Relationship Diagram (ERD)

The MAEDBS' data model will be represented in an ERD that displays the major tables, keys, and n:n relationships amongst them. A sample ERD is provided below to provide an expectation for the format:



Draft Design Document

The Design Document consists of the following topics:

Use Cases and Business Rules Documentation

Use Cases are developed to capture and refine a system's behavior. The use case evolves from a rough sketch of steps illustrating system activities to specific tasks that are inputs to system design artifacts. The use case specifications are used as an input to design, development, and testing. Use case specifications will cover the following major areas:

Item	Description
Actors	List the actors that interact and participate in this use case
Pre-Conditions	Pre-conditions that need to be satisfied for the use case to perform
Post-Conditions	Define the different states in which one expects the system to be , after the use case executes
Main Flow	List the events that will occur when this use case is executed. Include all the primary activities that the use case will perform. The flow forms the basis for writing the test case scenarios for the system
Alternative Flows	Subsidiary events that can occur in the use case are listed separately. A use case can have several alternative flows
Special Requirements	Business rules for the basic and alternative flows are listed as special requirements in the use case narration. These business rules will also be used for writing test cases
Use Case Relationships	If a use case extends from other use cases or includes the functionality of other use cases, these relationships will be listed here. Listing the relationships between use cases also provides a mechanism for traceability
Business Rules	The individual business rules that will need to be executed with the specific step, within the specific use case
Questions	Any questions posed by the Business Analysis and Technical teams will be documented in the use case, as well as the documented answers to the questions in order to maintain clear sight of the desired functionality
Requirements	All requirements being met through the functionality of the use case are documented and updated in the use case

Use cases not only provide CEC with a business-oriented view of how they will interact with MAEDBS, but it also provides the basis for how the system will be tested, both in System Test and User Acceptance Testing (UAT).

One of the most important elements in the use cases are the business rules. The business rules are the definitions of restrictions, constraints, exceptions, or other considerations that need to be factored into the functionality of the system. Both analysts and developers rely upon the business rules to confirm what needs to be coded into the system. While documented in each use cases, the business rules can also be segregated into a separate inventory, and are enumerated based on the ordering in the process flow.

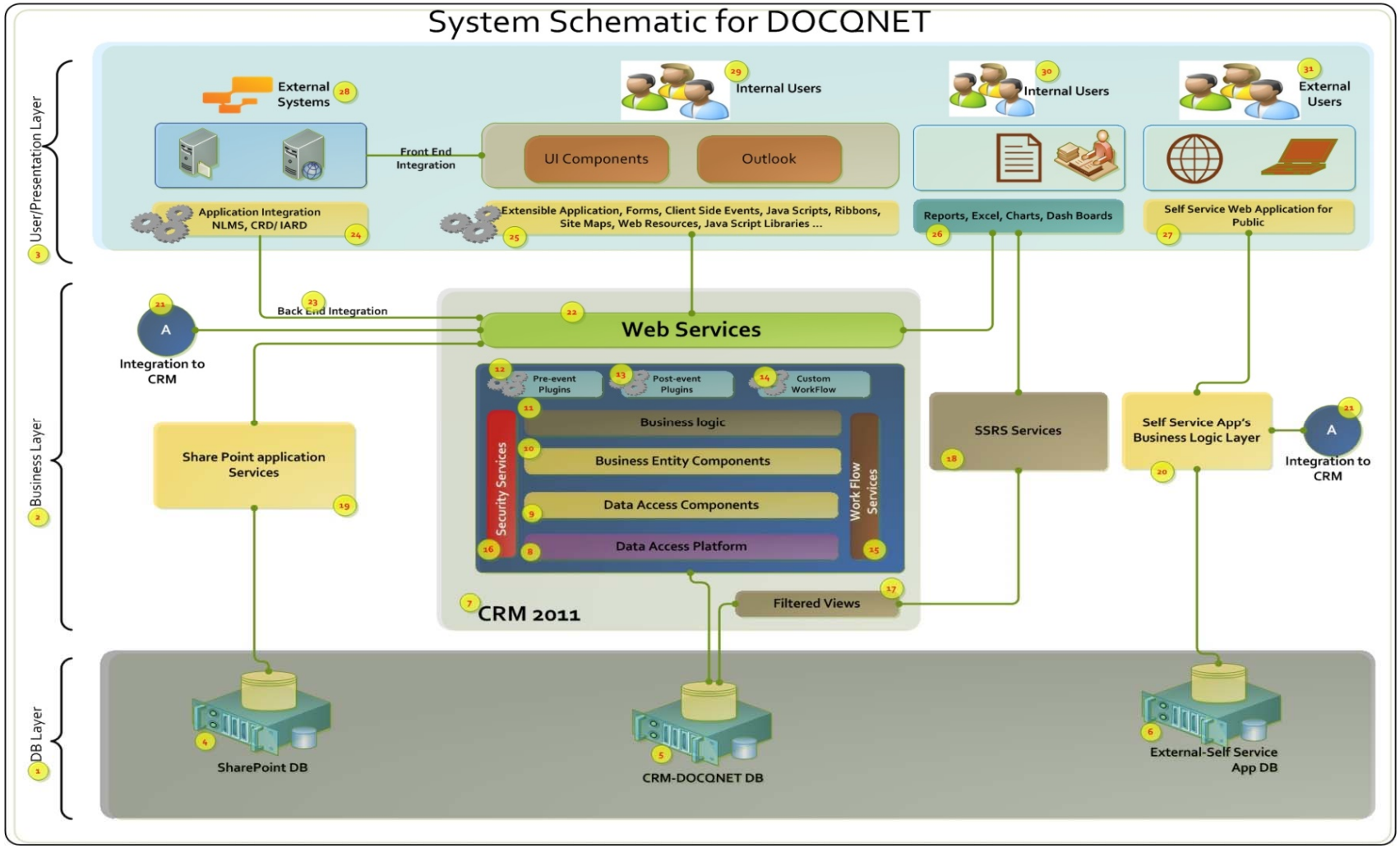
The business rules inventory is tracked in our project repository, as shown below:

BR#	RuleSet	Describtion	Related_Stories	Comments	Dev Item
1	Eligibility Determination	For a full payment return for both HEAP and Fast Track, LSPs can reissue total amount with in the 90 day window to the same applicant on the same application. On the 91st day applicant is eligible to reapply in the same program year with a new application and supporting documents and will be eligible for the full benefit amount based on the new application.	ST04; ST05		Returned Payments & Eligibility
2	Eligibility Determination	For partial credit returned for both HEAP and Fast Track, LSPs can reissue unused credit within the 90 day window. On the 91st day applicant cannot reapply in the same program year for the unused portion of the benefit.	ST04; ST05		Returned Payments & Eligibility
3	Eligibility Determination	Currently, an applicant can only have one paid application per program year for Utility Assistance	ST04; ST05		Customer - Duplicate Check; Application - Duplicate Check
4	Eligibility Determination	An applicant is not eligible to receive assistance if their POS is outside the eligible service area for the LSP submitting the application.	ST04; ST05		Applications - Out of Service Area
5	Eligibility Determination	The applicant is not eligible to receive assistance when the applicant's household size and total monthly income are not listed in the contract's poverty group table.	ST04; ST05		Eligibility Rule for Poverty Group & HH Size
6		The application uses rules from the contract that is effective during the date that the application is submitted.	ST04; ST05		
7	Priority Points Determination	Total number in household in each category is entered but only one person is counted toward priority points. So if 60 and older has 2 people the household will receive the point value for only 1.	ST04; ST05		Priority Point Calculation
8	Payments	UA payments will go to one utility company or customer	ST06		Application - How Much to Pay?
9		The Utility Account Number must match the format for the selected utility.	ST04; ST05		Utility Account Format
10		Both the LSP and CSD will perform research to resolve a deficiency and need to have authorization to modify the record.	ST04; ST05		Security Functions
11		LSPs can only override a Phone duplication and a POS duplication Deficiency	ST04; ST05		Security Functions
12		All applications coming via data transfer need to have duplicate and validations check as well as eligibility	ST05		
13		If a payment has reached a status of "Paid", but needs to be modified, then the status will need to be manually changed to a status of "Warrant Redeposit" - when the payment status is manually changed then the application status would be automatically changed to "Working - Deficient" with a deficiency of "Warrant Redeposited"	ST06		Security Functions; Returned Payments & Eligibility
14	Payments	In the event that an over payment occurs, the user should be able to flag the applicant's record.	ST06		Customer
15	Payments	LSP must have money in their allocation for the selected component for applications to be paid	ST06		Component - Allocations
16	WX	Negative line item totals are not allowed.	ST10		
17	WX	Travel cannot be charged to a job unless at least one other measure is installed.	ST10		
18	WX	Assessment entry is required.	ST10		
19	WX	For an initial weatherization, at least 3 priority measures must be installed	ST10		
20	WX	Modified assessment is not allowed on an initial weatherization	ST10		

The benefit to this separate inventory is that we can classify the business rules into Decision Sets. Decisions are categories of rules that are associated based on a broad business function. For example, a business rule that states “sum of line item expenditures must equal total expenditures” is part of a Decision Set called “Accounting Validation” where multiple rules related to the differing accounting procedures would be stored. This is a helpful method of categorizing rules for analysis and validation, but it also a direct input into the technical design of the rule-sets, as we are able to create rules in a logical manner that is more intuitive to understand and therefore easier to maintain in the long term. This is a crucial step in attempting to standardize the development and maintenance of the appliance calculation rules.

Solution Architecture

The solution architecture is a visual and table depiction of the system's components. The visual diagram portrays the UI layer, service layer, and data access layer, and their interactions amongst them. A sample architecture diagram from a previous TrinityTG project has been provided as an example:

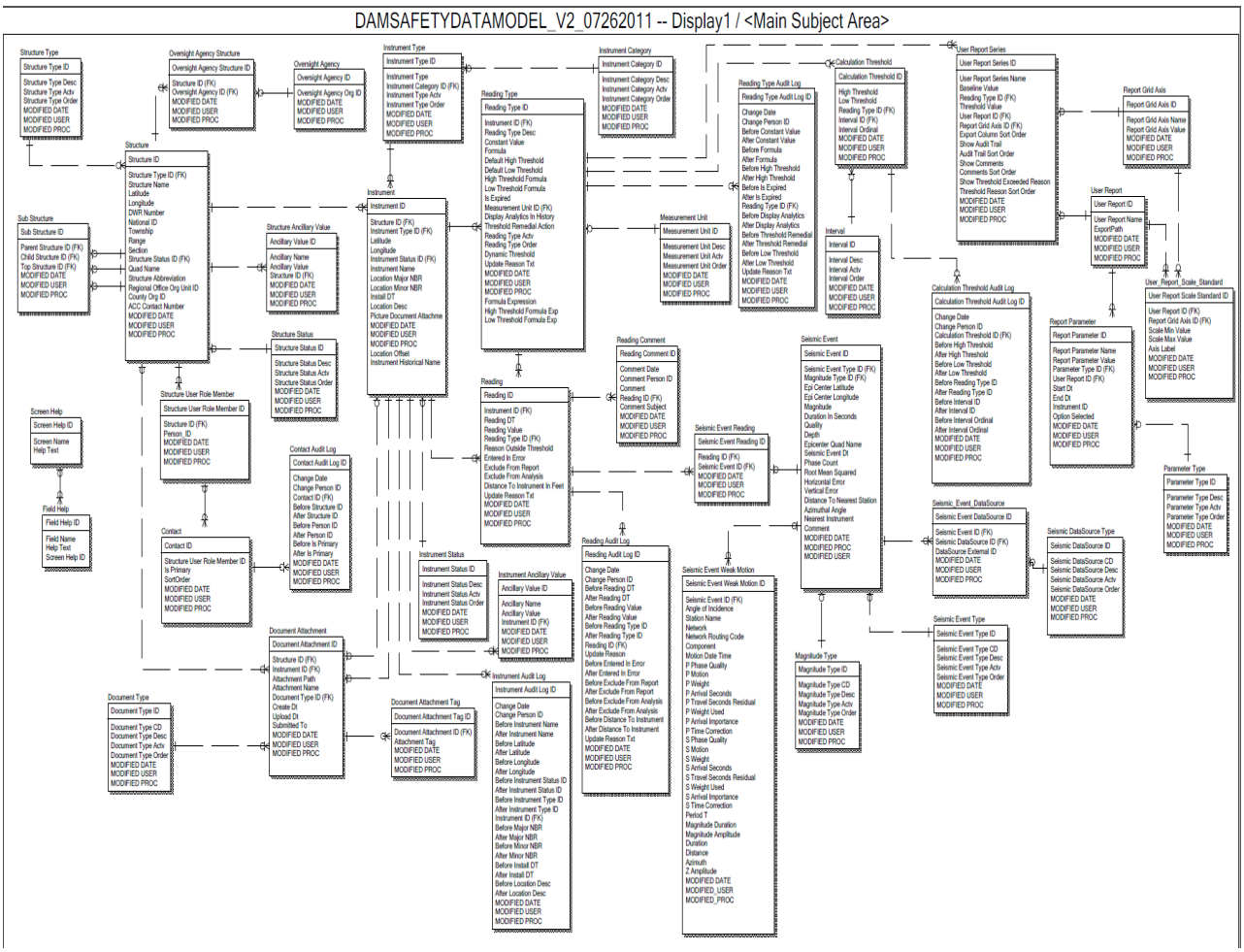


This diagram has each element numbered individually, which correspond to a table that describes the element in more detail. This tabular data is provided in the format as shown in the below sample:

No	Component	Tier	Description
	DB Layer	DB	Description of the DB instances of the solution
	Business Layer	Business	Description of the business layer function
	User/Presentation Layer	Presentation	Graphical User Interfaces (GUI), dashboards, reports, and self-service front-end website are in this layer.

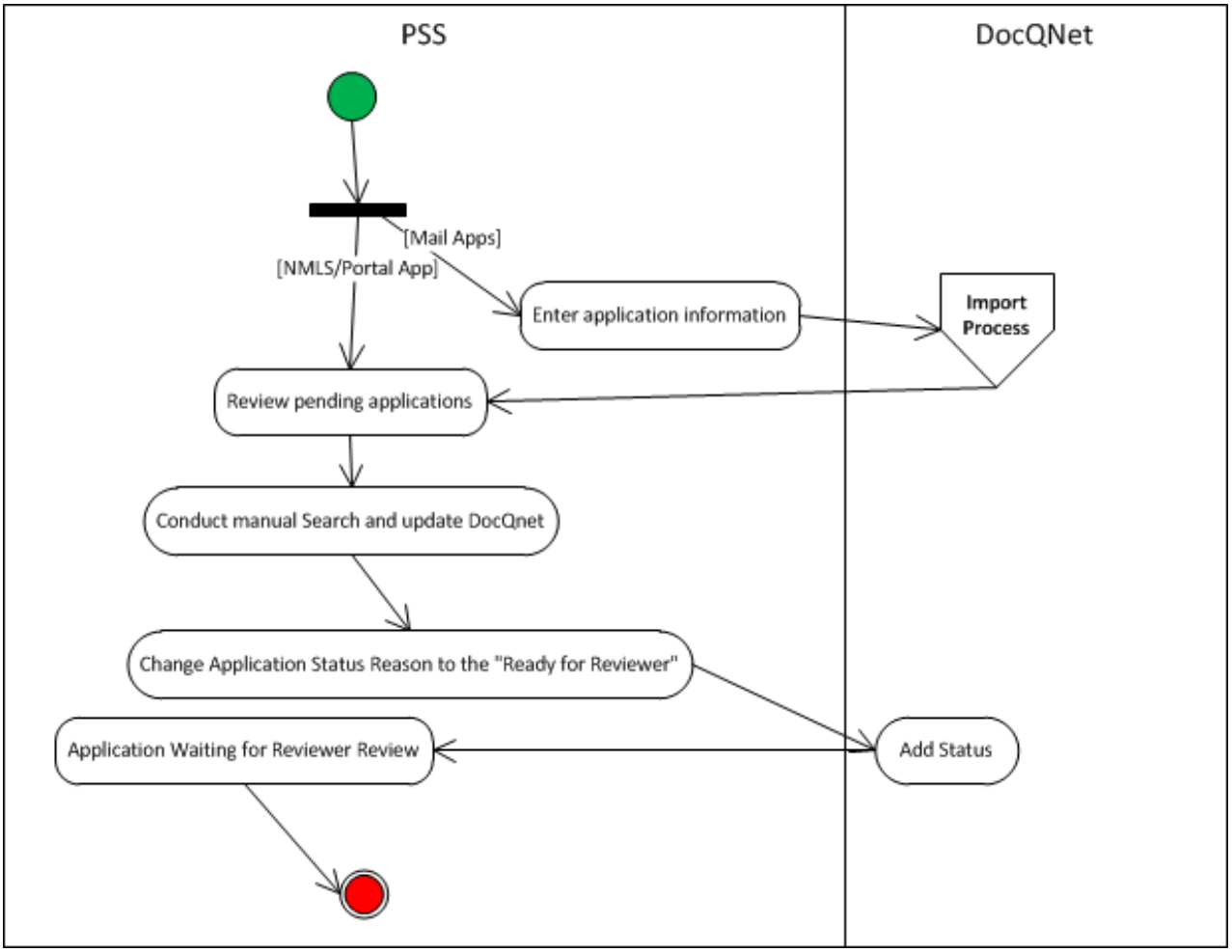
Logical Data Model

We use SQL Server to generate an industry –standard logical data model diagram which will be incorporated into the Detailed System Design deliverable.



Activity Diagram

Each use case has a corresponding activity diagram that show the actual logic to be automated. The following is a sample activity diagram:



Reports

Report specifications are provided in a table format to depict the report element and corresponding filter criteria.

Security Roles

Security Roles are defined, along with a list of the specific functions that the role is allowed to perform in the system.

Final Design Document

The Final Design Document will be in the same format and structure as the draft, only with selected content modified as needed to reflect any changes that were made to the design as a result of the build, testing, or implementation process of the project.

Data Layer – Empty Database

A copy of the physical database will be provided to CEC IT Staff as SQL database file. This physical database will correspond to the logical data model identified in Detailed Design.

Unit Test Results

First, all custom components that are required to be unit tested are inventoried in the project repository. Then each component is mapped to a class name in the Unit Test framework that we create in Visual Studio. The purpose of this mapping is to show what components run against what class in the framework. That mapping is provided in the Unit Test Results in the format shown below:

Sr. No.	Code	Proc/Screen Name	Class Name in Unit test
1.	PROC01	Import Process	ImportSRDApplicationProcessUnitTest PreApplicationUniqueGeneratorUnitTest Report02UnitTest
3.	Proc10	Import branch Offices	ImportBranchOfficeUnitTest
4.	Proc07	Import Data Amendments	IncomingDataAmendmentUnitTest CapitalRequirementUnitTest Report02UnitTest

During Unit Testing, each component is run through the framework to simulate proper input, output and transactions. As part of the deliverable we submit the result of last run of the unit tests as an htm file. As sample result table in the htm file is shown below:

CMS_UnitTestProject.BusinessObjectUnitTest.ApplicationUnitTest		
CMS_UnitTestProject.BusinessObjectUnitTest.ApplicationUnitTest.Proc15IsAllowedTORunWhenItsBeen25Days	✓	00:00:00.2557350
CMS_UnitTestProject.BusinessObjectUnitTest.ApplicationUnitTest.Proc15IsAllowedTORunWhenItsBeen29Days	✓	00:00:00.0002362
CMS_UnitTestProject.BusinessObjectUnitTest.ApplicationUnitTest.Proc15IsAllowedTORunWhenItsBeen60Days	✓	00:00:00.0002199
CMS_UnitTestProject.BusinessObjectUnitTest.ApplicationUnitTest.Proc15IsAllowedTORunWhenItsBeen120Days	✓	00:00:00.0002176
CMS_UnitTestProject.BusinessObjectUnitTest.ApplicationUnitTest.Proc15IsNotAllowedTORunWithoutReceivedDate	✓	00:00:00.0002651
CMS_UnitTestProject.BusinessObjectUnitTest.ApplicationUnitTest.Proc15IsNotAllowedTORunWithoutReceivedDateIsNull	✓	00:00:00.0001282

The first column in the above screenshot represents the name of the class and all the unit test methods. Second column represents if the individual test passed or failed and the last column gives the time take to execute a test. Ultimately, the deliverable will show all unit tests have passed.

Interface Layer – Draft Web Pages

The TrinityTG/C&G Team has a unique approach to providing draft web pages. The draft web pages are provided in a UI simulation tool called iRise. iRise allows us to mock up detailed webpages that simulate look and feel, navigation, hyperlinking, and even data validation. This draft is provided in a single “idoc” file that is readable using the iRise Reader, which is a free download and works with any web browser. From the reader, CEC staff will be able to see all of the web

pages and click through the simulation as if the pages were fully developed and integrated with the database layer, giving you the most accurate depiction possible of how the system will function.

Master Test Plan

To be effective the test plan must be a roadmap for defining and managing the entire testing lifecycle of the project. Our test plans include content designed to address all aspects of testing. The following table identifies the topics our proposed test plan will include:

Topic	Description	Insights
Testing Strategy	Defines the types of testing to be conducted (e.g. unit, system, performance, UAT) and what will be tested within each of those areas	MAEDBS will include Unit, System, UAT, Regression and Performance/Stress testing as part of the overall strategy
Testing Process and Scenarios	Defines the test lifecycle to be used on the project, and identifies the test scripts for each type of testing defined in the strategy.	Our testing cases and scripts are organized by use case, which provides a much more thorough context than testing by individual requirement. With use-case oriented testing we are able to develop scripts that provide more of an end to end focus on testing. These scripts are not only more comprehensive in testing the solution, but they are easier to understand and execute upon.
Item Pass Fail Criteria	Defines the workflow and statuses that will be used to manage the script tracking process. This typically includes three levels of definition: • Test Script Status • Defect Priority Level • Defect Status	We expect to adopt the severity standards outlined by CDE. For defect status, our methodology includes a recommend lifecycle.
Test Deliverables	A list of actual deliverables to be produced as part of the testing lifecycle.	The test deliverables for MAEDBS will include all of the deliverables listed in the SOW.
Environmental Needs	Defines the physical and logical environment topology needed for testing, along with the software tools that will be used for testing, and test data requirements. Logistical needs (e.g. workstations, rooms, etc.) are also defined here.	We anticipate a single test environment with a combined database/application server for unit and system testing. UAT will occur in a staging environment that mirrors production. The most important aspect of the staging environment is that it will have an SSL encrypted web server to emulate the production environment as closely as possible.

Topic	Description	Insights
Roles and Responsibilities	Defines all of the roles for TrinityTG, and CEC staff	It is important to identify roles and responsibilities as early as possible so that CEC, Business Partners, and other client stakeholders have ample time to prepare for the necessary time commitment.
Schedule	Provides a task list and timeframes that show the testing schedule relative to the overall project plan.	The Test Plan will contain a subset of the project plan that includes all the testing-related project activities along with resource loaded staffing needs. The UAT schedule is published at the same as the System Test schedule. This allows CEC as much time as possible to schedule needed UAT resources for the time commitment needed for the testing effort. Also, the published schedule will be important for gathering data and/or participation from interface partners, who will need to be engaged in the system and UAT effort.
Risks and Contingencies	Identifies potential risks that would delay or hinder the testing efforts, and presents contingencies on how to address those risks.	By identifying possible issues that could delay the schedule and presenting alternate strategies, we are able to better manage scope by staying on schedule.

Test Lifecycle

Each testing phase progresses through its own life cycle with each step leading directly into its successor. The process continues to refine the product until it is ready for UAT. The following table defines in stage in our proposed test lifecycle:

Process Step	Activity	Description
Plan	Develop a Test Plan	Define strategy, test types, tools, approaches, timelines, testing hardware and software.
Design	Create Scenarios and Scripts	Create test cases and test scripts and have them reviewed prior to the commencement of testing. Test data creation is included in this phase.
Execute	Execute Test Cases/ Scripts	Execute test scripts in the test environment: 1. Retrieve the Test Case assignment from the Test Tracking spreadsheet. 2. Retrieve the Test Case and applicable data to run the test. 3. Execute the steps in the test and record the results. 4. If the script passes, update the Test Tracking spreadsheet. 5. If the script fails, log an issue via the CRM project repository, and update the Test Tracking spreadsheet.
Document	Document Test Results	Testers will document test progress in a spreadsheet that contains the list of test cases, using a simple pass/fail mechanism. Once a script has been executed the tester will determine if the status will be changed to “Passed”, “Failed”, or “Passed with Issues.” The following descriptions define what each of these statuses mean: • *Passed* – A test case will be considered “Passed” when no issues have been logged.

		• *Failed* **–** A test case will be considered "Failed" when one or more issues have been logged of Severity type 1 or 2 (severity definitions are provided below) • *Passed with Issues* – A test case will be considered "Passed with Issues" when one or more issues have been logged of Severity type 3.
Review	Review Execution Results	Review the test results and defect reports with the Project Management, and relevant testing and development staff. A short meeting should be used for communication between the testing and development staff (as well as key project management) to identify priority defects and to discuss issues and trends in the build. In this meeting, the system test team will provide the following metric reports to aide in the discussion: 1. Overall System Test Report – For the overall effort what is the status of the scenarios/scripts? 2. Scenario/Script Status – For each scenario/script what is the status?
Fix and Promote	Fix Software and Promote Changes	Fix software based on documented issues with the system. Work with the configuration management lead to promote changes to the various environments.

System Test Summary Report

The System Test Summary report includes all of the topics requested in the RFO. The report is divided into two sections – Testing Summary and Defect Summary

Testing Summary

The testing summary includes summary statistics of pass fail status, such as the sample shown below:

Total Scripts	**222**
Total Passed	102
Total Passed with Issues	61
Total Failed	45
Total Not Started	12
Not Testable*	1

The testing summary also shows how those scripts map to the use cases defined during detailed design. By using this approach we are able to denote how the testing effort covered the scope of functionality. This mapping is provided in a table like the sample provided below:

UCID	Name	# of Scripts	#Executed
UC01	Intake Import	24	24
UC02	OT Intake Checks	3	3
UC03	App Processing	22	22
UC04	Surrender Import	10	10

Defect Summary

The defect summary includes both summary statistics, as well as narrative on how to address the specific remaining defects. Sample tables are provided below to demonstrate the expected deliverable format:

Defect Summary Statistics

Total Defects	258
Total Closed	137
Total Ready for Re-Test	40
Total Reassigned	4
Total in Bug Fix	1
Total Identified	75
Total As Designed	1

Open Defects by Severity Level

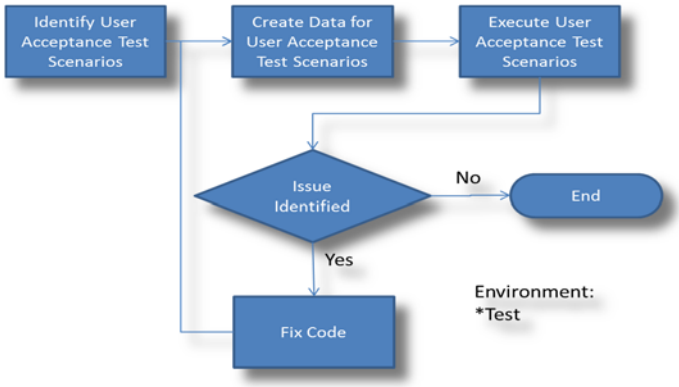
Status	Critical	High	Medium	Low	Total
Total Ready for Re-Test	5	20	15		40
Total Reassigned			4		4
Total in Bug Fix			1		1
Total Identified		9	56	10	75
Total As Designed			1		1

Mitigation Plan for Open Defects

Issue Area	Mitigation/Resolution Approach
Defects in Ready-For Retest Status	
Critical and High Priority Defects	
Defects linked to scripts in Not Started status	
Remaining Medium Severity Defects	
Remaining Low Severity Defects	.

Recommended User Acceptance Test Plan

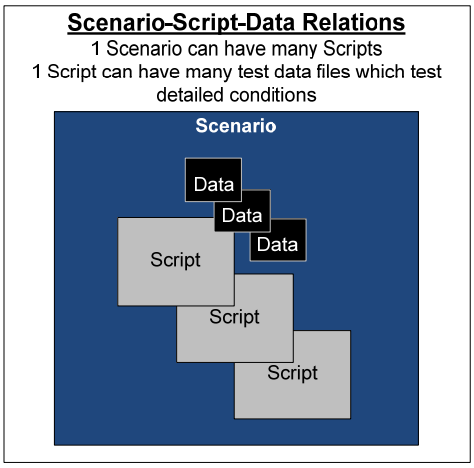
The User Acceptance Test Plan is derived from the master test plan in terms of overall test lifecycle, defect management, and approach. But there are several aspects that are unique to UAT, and those are included in the UAT Plan.



When system testing is complete, the software is ready for User Acceptance Testing (UAT). User acceptance testing is a phase of development in which the software is tested by the end users. UAT will be led and executed by the program staff and TrinityTG. The goal of UAT is to help the business users visualize how the application is meeting the requirements which the application was built off of. The process follows the same paradigm as the previous testing approaches.

UAT Scenarios, Test Cases

Components of the application that are intended to be tested will have scenarios and scripts defined. The scenarios are typically a subset of the system test scenarios, but this varies depending upon the scope of UAT. The Test Plan that we create for the project will propose a method for scripting UAT The following illustration defines the relationship between the test scenarios, test scripts, and test data associated to the scripts.



Acceptance Environment Prep

Before testing can begin there needs to be an appropriate sign off on the condition of the UAT environment. Ideally this is a single use environment that is just for UAT, however it can be used as a "System Test" environment if need be. If it does become a dual purpose environment there is a coordination effort that needs to occur.

Test Execution

There are several components to the test execution described in more detail below

- Schedule – the specific UAT schedule is defined so that CEC staff can begin planning time
- Roles/Responsibilities – any specific roles/responsibilities for executing UAT are defined in the plan
- Internal Team Execution – Scenarios and scripts that are executed by internal CEC staff, defects are logged where appropriate. Testing is completed when the scenarios pass at an appropriate level.
- External Portal Testing - Scenarios and scripts are written to simulate the external user experience, and defects are logged where appropriate. Testing is completed when the scenarios pass at an appropriate level.
- Analyze Results and Determine Action – Results of the testing are reviewed, scenarios are either passed or failed. If too many scenarios fail there may be a need for an additional round of UAT testing.
- Modify Application - Defects are fed into a defect lifecycle and fixed where appropriate, these defects eventually cause modification to the application and are retested.

Fix Defects

We follow the established defect management workflow used for System Test.

Regression UAT

In order to validate the various releases to the testing / UAT environment, the regression script execution will be coordinated with each build cycle to the test environment.

Signoff

User Acceptance Testing sign off ends the UAT period and allows for the preparations to be made for the production environment and go-live.

User Acceptance Report

The User Acceptance Test report is provided in a format similar to that defined for the System Test Summary report. The difference is that the UAT Report includes narrative related to overall readiness of the system to deploy.

Data Conversion

We tightly coordinate data conversion following an established conversion plan and roll out schedule to promote the new system operating properly with complete and accurate data. This methodology provides the team a repeatable approach with focus on earlier identification and resolution of issues. One of the ways we accomplish this is by conducting several layers of analysis prior to developing the Data Conversion Plan.

The following table provides a summary of each step in our methodology:

Phase	Description
Define / Confirm Data Model	The Trinity Team completes and validates the conceptual data model. This task includes: • Review and complete the data requirements as part of Gap analysis. • Identify / confirm major entities • Identify / confirm major relationships • Validate Conceptual Model
Design Conversion Inventories	Within the business analysis phase of the project, we review the requirements and gaps to determine the conversion inventories. The conversion inventory includes a list of conversion programs for extraction, cleansing, loading, and validation of data.
Design Data Conversion	The objectives of this task are to: • Evaluate the data required for the conversion availability and accuracy • Analyze the existing data sources • Design a technical approach for extracting, manipulating, and staging the data • Identify and setup conversion tools for improving data conversion efficiency and managing risks
Develop Data Conversion Plan	Once the perquisite analysis and design activities have been completed, we develop the Data Conversion Plan. This deliverable documents the data sources, conversion methods, timelines, tools, and environments needed to manage the conversion effort.
Perform Detailed Data Conversion Design	The activities in Design include creating a Data Mapping document for each conversion data source. Each program has a detailed design that includes: • Source format • Detailed Data Maps • Conversion rules for each condition or transaction being converted and methods for calculating default values as appropriate • Description of the conversion method for each data source • Table updates or additions • Error handling • Validation requirements Besides conversion load programs, we also develop reports and queries required to assist with data validations and remedies.
Build and Test Conversion Components	Developers code the conversion programs using the error processing and reporting defined in the conversion approach and designs. The code goes through a code review and component test (unit test) within the conversion environment. We complete fixes as needed until obtaining validation of a successful component test.

Perform Mock Conversion	Mock conversions include the full volume of data for the conversion they intend to test. We complete successful mock conversions before each phased Production conversion to validate the conversion process and converted data. This also is used to launch the data clean-up process.
Convert Data	Execution of the final data conversion scripts during the production implementation phases.

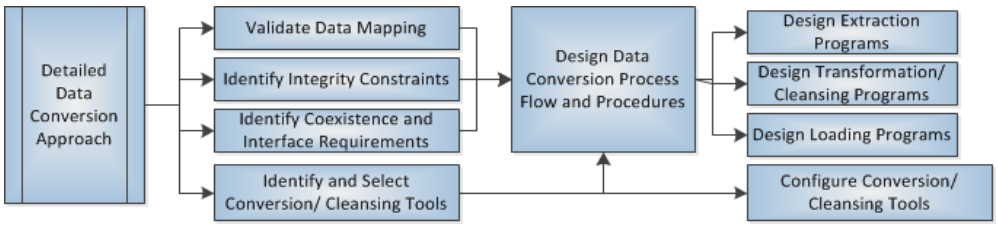
Data Conversion Plan Details

The Data Conversion Plan contains the following information about in-scope data sources:

- Document the Conversion method, strategy and environments
- Review the logical data model and determine the structure of data to be converted
- Document the file and database names and descriptions
- Document dependencies
- Confirm data history requirements
- Develop a cross-reference of source data elements to the new data elements
- Determine and define any specific data requirements, such as null values or calculations, for target data
- Develop a high level conceptual design of the conversion process coupled with a more detailed design illustrating inputs and outputs
- Document error and exception handling (we use an error logs to allow reporting against errors and production of a data purification log showing the keys for data needing to be addressed)
- Document the controls (controls include business controls allowing a comparison of the converted data to the source data) and reports
- Document the checkpoint approach (checkpoints are validation and rollback spots within the conversion process)
- Document Conversion reversal (this is the contingency approach to roll back to a prior conversion checkpoint or completely reverse a conversion if it does not get a “go” at the go/no go checkpoint for any reason)
- Identify all security access and controls needed
- Identify the assumptions and risks and document the mitigation strategy
- Any assumptions or constraints
- Any outstanding issues

Data Conversion Design Approach Details

The design phase of data conversion is where many of the critical path activities are completed. The following section provides details on how we approach the design of data conversion and the overall methodology for design.



Validate Data Mapping

Based on identified data sources, we produce a detailed data mapping document for each data source that shows all of the tables and field mapping between source and target, including:

- ID-element unique id
- Name-element name
- Priority-determination of whether or not a field is required from a mapping perspective
- Format-type of data, e.g. varchar
- Status-mapped/not-mapped
- Derivation Rule-specific data element and derivation rules being used to migrate data.
- Last Update-tracking date that shows if/when updates were made to mapping information

A sample formatted data mapping report is shown below:

2 Table Name: Recipient

Table Derivation: Use:
recipient
stateagency
state
congressdistrict
contractingoffice
statesenatedistrict
stateassemblydistrict

Join:
recipient.stateagencyid = stateagency.id
recipient.stateid = state.id
recipient.ppopstateid = state.id
recipient.InfrastructureContactStateId = state.id
recipient.CongressionalDistrictId = congressdistrict.id
recipient.ppopCongressionalDistrictId = congressdistrict.id
recipient.ContractingOfficeId = Contractingoffice.id
recipient.PPoPStateSenateDistrictId = statesenatedistrict.id
recipient.PPoPStateassemblyDistrictId = stateassemblydistrict.id

Create a record for each record in recipient.

Last Update: 2/12/2010 3:05:09 PM

Target Element Information:
ID: 1 **Name:** StateAgencyName **Priority:** FUNCTIONAL **Format:** varchar(55) **Status:** Mapped
Derivation Rule: set StateAgencyName = stateagency.AgencyName
Last Update: 2/12/2010 2:26:50 PM

Target Element Information:
ID: 2 **Name:** DUNSNumber **Priority:** FUNCTIONAL **Format:** varchar(9) **Status:** Mapped
Derivation Rule: set DUNSNumber = recipient.DUNSNumber
Last Update: 2/12/2010 2:27:17 PM

This deep level of granularity in the data conversion process allows for a high level of accuracy, reduces the error rate, and provides a workable format for CDE functional and technical staff to read and understand how our data conversion scripts are transforming data.

Identify Integrity Constraints

Integrity constraints are a set of data validation rules that can restrict the data values accepted into a data file. Using integrity constraints preserves the correctness and consistency of stored data. In this step, we identify and document the integrity constraints of the data considering the source system and database design. Constraints are defined within the business rules and are part of the validation during program execution.

Identify Co-existence and Interface Requirements

If needed, we identify the issues related to coexistence of data in multiple sources. For example, we identify which source takes precedence, when to synchronize, what is updated, when, and by whom.

Identify and Select Conversion and Cleansing Tools

For database conversions, there are different options, including SQL procedures and interactive database tools. In general we recommend using SQL procedures when converting a large amount of data, especially with data needed in many tables. The procedures use temporary tables and cross-reference tables to convert the data. Interactive database tools are very useful for inserting new data when the amount of data is relatively small.

Design Data Conversion Process Flow and Procedures

The steps to design efficient and effective data conversion process flows are:

- Determine the data conversion tasks that is carried out in advance or during the conversion runs
- Determine other tasks related to updating, maintaining, or loading the data
- Define the flow of the data conversion programs, including extraction, cleansing, summarizing (if needed), and loading
- Determine which tasks are automated, which are manually executed, and the interactions between the automated and non-automated tasks
- Include time constraints, interaction with personnel executing the data conversion
- Determine the order of conversion processes. For example, you have to load some data tables before you can load other tables
- Document the location of all data conversion processing, including associated physical resources
- Refine the time dependencies between the conversion tasks

Design Extraction Programs

As part of the design we will work with CEC to determine the optimal method of ETL. But based on our experience with the technology platforms involved we are likely to use SQL Server Integration Services (SSIS) to create a series of repeatable scripts that will access data from the legacy sources.

A parallel activity to the design of the ETL programs is the approach for data clean-up. Data clean-up/purification involves identifying problems and cleansing legacy system data to ensure the complete and accurate conversion of data to the MAEDBS system for production. While TrinityTG supports the identification and recommendation of cleanup activities, ultimately we rely upon the owners of the data (CEC staff) to take an ownership role in the cleanup. To support this effort we establish a formal communication process of progress, status, and issues on a regular basis. This includes the tracking of exceptions and errors, the volume of errors and their status within spreadsheets developed and managed by the Conversion lead.

Our experience has shown that Data clean-up activities involve automated, semi-automated, and manual processes depending on complexity, schedule, and data volume. If possible, we recommend source systems cleanse their data prior to capturing the data to convert. We understand the constraints in this approach and program purifications into the process where a value can be calculated, derived, or defaulted.

In a few cases, data problems may be corrected within MAEDBS after conversion, once the system becomes available in production. This is only an option if the data does not impact production processing.

Conversion Environments

We are proposing that conversion can be completed without the need for a separate conversion environment. For the majority of our implementations we have been able to make use of the development and testing environments for parallel data conversion development and testing without disruption to the application build/test activities.

This has worked successfully for two reasons:

1. Our toolset enables us to minimize disruption to the environment. For example, import of Excel and Access based data is managed by built-in scripting tools that reduce the need for

an intermediate environment. And for custom sources we use temporary tables (e.g. TEMP_systemname_tablename) that are instantiated separately from the Core CMS application tables allowing us to test the raw data before loading into the system. Using our approach the conversion quality is typically high enough (50% or more) in our initial loads that we can conduct valid tests directly on the application.

2. Our testing approach relies upon converted data in all phases of testing and implementation. As early as system testing we are using converted data to test functionality, meaning that it is beneficial to move data into the testing environment as early as possible.

With respect to the conversion effort, the tasks will differ based on the stage of development. The following table provides a high level summary of the key focus areas for each phase of the data conversion process as it progresses through the SDLC:

SDLC Phase	Details
Analysis	During this phase of requirements validation, we are also identifying data sources and candidate conversion methods
Design	During design, we are heavily involved in data mapping, identifying integrity constraints, and actually creating data conversion scripts based upon the base data model. It is during the design phase that we produce the data conversion mapping.
Build	During Build we are developing the data scripts and validating their functionality in two ways: 1. The performance of the scripts vs. the mapping artifacts (e.g. are we transforming the data per the specifications 2. The performance of the converted data against the target database (e.g. does the data properly load and adhere to the integrity constraints of the development database)
Test	During testing we are actively converting data iteratively into the testing environments. The objective is both to test the functionality of SSR as well as the business functionality of the converted data. For UAT, we migrate data resulting from our Mock data conversion efforts in order to deliver a higher-fidelity dataset for UAT testers.
Implementation	In addition to actually converting the final production data, we spend considerable time in a planning and monitoring mode so that we can properly orchestrate the load of data with all of the other implementation and deployment activities. Activities include: • Review of the planned checkpoints in the conversion process where it is backed-up and validated - these checkpoints provide rollback spots in the conversion process and mitigate against a failed conversion window • Review of manual processes required including preparation and validation, and an estimated work effort and timeline for each • Validation all special conversion training, such as conversion data entry or validation and control, the number and type of support staff and required time frames • Review of assumptions or constraints • Review outstanding issues • Review of Conversion checklist that includes items such as backups, staffing, legacy system readiness, freezes, etc.

Conversion Reporting

We develop a detailed set of metrics to report against for each Mock and the Conversion to Production. This reporting includes timings, errors, warnings, validations, and inventories of any records requiring manual cleanup. This will be detailed further when the plan is submitted for approval during the Design activities.

Training Plan

The MAEDBS training plan includes the following topics:

Training Pre-Requisites

To the extent that CEC staff require preparation prior to the training courses, these requirements will be documented in the Pre-Requisites

Training Strategy

The training strategy includes details on:

- Roles and Responsibilities
- Class Sizes – identifying the maximum number of participants per class
- Training Time Commitments (only if the plan requires something substantially different than the timeframes noted in the RFO)
- Class Schedule – identifying the actual dates, times, and room location for the class
- Verify Environment – define and identify requirements for the training class
- Define Materials – identify the necessary materials to deliver the training
- Certification – define evaluation process & signoff procedures to certify training is complete

Training Methods and Tools

Our identified training methods and tools include:

- Presentation / Overviews
- Instructor-led Training (ILT)

Training Curricula and Organization

The Training Plan will include the specific training topics. Candidate topics are proposed below:

Course	Topics
MAEDBS Servers/ Architecture	Review of physical and logical topology, as well as overview of the software components
Solution Maintenance	• Patches/Rollups Installation • Workflow Management/Maintenance • Web Service Maintenance • Reports • Security • Business Rules
Account and User Management	• Registering for access • Managing user profiles • Password maintenance
Data Submission	• Key Data Entry • Bulk Data Upload • Re-uploading incremental data

Training Materials

Training Materials include a list of topics covered in the training courses, complete with step by step instructions and screenshots to support how to complete the listed tasks.

Another format for the training material we wish to propose is multimedia. We are able to produce a series of instructional videos that provide users with visual examples of how tasks are completed. These are provided in Windows Media format, or can be hosted on the CEC website. This is useful for producing content that can help manufacturers and third parties use the external portion of the system. Samples of such videos can be provided to CEC at their request.

Training Sessions

Training sessions are delivered in person at CEC. At the end of the course, the staff will be provided with evaluation forms to gauge the overall effectiveness of the sessions. This information will be aggregated and provided to the CEC Project Manager in order to aid in the determination of the training completeness.

Final Web Pages

The final web page provided to CEC would be the actual ASP.NET forms that are deployed in the production environment. While these can be provided as standalone .html files , we recommend simply providing this deliverable as a single package with 6.6. Integrated System into Production.

Part of the final acceptance is the accessibility standard. We make use of a tool called Sortsite that tests websites against a variety of standards. We will use Sortsite in order to check for Section 508 compliance guidelines, and provide these results in a report along with the Final Web Pages deployed in Production.

Integrated System Into Production

The final version of MAEDBS will be migrated into Production and administrator access will be provided to CEC staff responsible for approving the system's readiness for production. The source code will be provided to CEC staff in order to review code comments. The final version of the system, once approved will be deployed into Production and the "version 1.0" source code will be delivered to CEC at that time.

Final System Transition, Warranty Period and Final Acceptance

During this period, TrinityTG/C&G Team provides maintenance and warranty for four months after the go-live date. During this period the team corrects identified defects and conducts ongoing knowledge transfer sessions as defined in the project schedule.

7. Schedule

Task Name	Duration	Start	Finish	Predecessors	Resource Names
1. Project Management	**375 days**	**Mon 6/2/14**	**Mon 11/30/15**		
Project Kickoff	1 day	Mon 6/2/14	Mon 6/2/14		Amit Rai
1.1 Project Management Plan	**24 days**	**Tue 6/3/14**	**Mon 7/7/14**		
Develop Project Management Plan	10 days	Tue 6/3/14	Mon 6/16/14	3	Amit Rai
Deliverable Review	10 days	Tue 6/17/14	Mon 6/30/14	5	CEC Staff
Updates and Signoff	4 days	Tue 7/1/14	Mon 7/7/14	6	Amit Rai
1.2 Bi-Weekly Status Report	293 days	Mon 6/2/14	Fri 7/31/15		Amit Rai[20%]
1.3 Project Schedule Update	293 days	Mon 6/2/14	Fri 7/31/15		Amit Rai[5%]
1.4 Project Management Plan Updates	268 days	Tue 7/8/14	Fri 7/31/15	7	Amit Rai[5%]
1.5 Final Acceptance Document	5 days	Fri 11/20/15	Mon 11/30/15	176	Amit Rai
2. Analysis	**67 days**	**Tue 6/3/14**	**Fri 9/5/14**		
2.1 Analyze Current System	**40 days**	**Tue 6/3/14**	**Tue 7/29/14**		
Application Efficiency Database	2 days	Tue 6/3/14	Wed 6/4/14	3	Sverre Schiotz
Manufacturer Contact Files	2 days	Thu 6/5/14	Fri 6/6/14	14	Sverre Schiotz
Test Lab Database	2 days	Mon 6/9/14	Tue 6/10/14	15	Sverre Schiotz
Enforcement Database	2 days	Wed 6/11/14	Thu 6/12/14	16	Sverre Schiotz
Appliance Testing Database	2 days	Fri 6/13/14	Mon 6/16/14	17	Sverre Schiotz
Conduct Inventory of Appliance Registration Data Elements (70)	30 days	Tue 6/17/14	Tue 7/29/14	18	Jessica Hovdesven, Athina Addison
2.2 Staff Interviews	**7.5 days**	**Tue 6/17/14**	**Thu 6/26/14**		
Key Staff 1	0.5 days	Tue 6/17/14	Tue 6/17/14	18	Jessica Hovdesven
Key Staff 2	0.5 days	Tue 6/17/14	Tue 6/17/14	21	Jessica Hovdesven

Task Name	Duration	Start	Finish	Predecessors	Resource Names
Key Staff 3	0.5 days	Wed 6/18/14	Wed 6/18/14	22	Jessica Hovdesven
Key Staff 4	0.5 days	Wed 6/18/14	Wed 6/18/14	23	Jessica Hovdesven
Key Staff 5	0.5 days	Thu 6/19/14	Thu 6/19/14	24	Jessica Hovdesven
Follow Ups As needed	5 days	Thu 6/19/14	Thu 6/26/14	25	Jessica Hovdesven
2.3 Requirements Document - Traceability Matrix	**27 days**	**Wed 7/30/14**	**Fri 9/5/14**		
Document Requirements in Project Repository	2 days	Wed 7/30/14	Thu 7/31/14	13,20	Athina Addison
Create Requirements Document	10 days	Fri 8/1/14	Thu 8/14/14	28	Athina Addison
Deliverable Review	10 days	Fri 8/15/14	Thu 8/28/14	29	CEC Staff
Updates and Signoff	5 days	Fri 8/29/14	Fri 9/5/14	30	CEC Staff, Athina Addison
3. Design	**87.5 days**	**Thu 6/26/14**	**Wed 10/29/14**		
3.1 Establish Database Design	**15 days**	**Wed 7/30/14**	**Tue 8/19/14**		
Develop Entity Relationship Diagram	5 days	Wed 7/30/14	Tue 8/5/14	19	Greg Harvey
Develop Logical Data Model	10 days	Wed 8/6/14	Tue 8/19/14	34	Greg Harvey
3.2 Draft Design Document	**87.5 days**	**Thu 6/26/14**	**Wed 10/29/14**		
Develop Use Cases	21 days	Thu 6/26/14	Mon 7/28/14	26	Jessica Hovdesven
Design System Architecture	5 days	Wed 7/30/14	Tue 8/5/14	19	Amit Rai
Design Bulk Data Import Format	5 days	Wed 7/30/14	Tue 8/5/14	38SS	Greg Harvey
Design Bulk Data Validation Management	5 days	Wed 8/6/14	Tue 8/12/14	39	Amit Rai
Design Account Management	4 days	Wed 8/13/14	Mon 8/18/14	40	Amit Rai
Design Security Model	5 days	Wed 8/20/14	Tue 8/26/14	35	Sverre Schiotz
Design Administration Functions	3 days	Tue 8/19/14	Thu 8/21/14	41	Amit Rai
Design Workflow Engine	11 days	Wed 8/6/14	Wed 8/20/14	38	Jeremy Dean

Task Name	Duration	Start	Finish	Predecessors	Resource Names
Design Business Rule Calculation	11 days	Thu 8/21/14	Fri 9/5/14	44	Jeremy Dean
Design UI Template	10 days	Wed 7/30/14	Tue 8/12/14	38SS	Hemal Mehta
Design Reports	7 days	Mon 9/8/14	Tue 9/16/14	31	Athina Addison
Design Data Export Functions	10 days	Fri 8/22/14	Fri 9/5/14	43	Amit Rai
Design Responsive Page Design for Mobile	8 days	Mon 9/8/14	Wed 9/17/14	45	Jeremy Dean
Design Help	8 days	Wed 7/30/14	Fri 8/8/14	38SS	Jessica Hovdesven
Design Search	5 days	Thu 9/18/14	Wed 9/24/14	49	Jeremy Dean
Draft Deliverable	10 days	Thu 9/25/14	Wed 10/8/14	51	Athina Addison
Deliverable Review	10 days	Thu 10/9/14	Wed 10/22/14	52	CEC Staff
Updates and Signoff	5 days	Thu 10/23/14	Wed 10/29/14	53	CEC Staff, Athina Addison
4. Build	**130 days**	**Wed 8/27/14**	**Mon 3/9/15**		
Develop Common Framework and Setup Solution	**6 days**	**Thu 9/25/14**	**Thu 10/2/14**		
Setup Solution	1 day	Thu 9/25/14	Thu 9/25/14	52SS	TrinityTG .NET Developer
Develop Exception Handling, Logging, Common Bases Classes, Notification	5 days	Fri 9/26/14	Thu 10/2/14	57	TrinityTG .NET Developer
4.1 Construct Data Tier	**60 days**	**Wed 8/27/14**	**Thu 11/20/14**		
Develop Physical Data Base	10 days	Wed 8/27/14	Wed 9/10/14	42	Greg Harvey
Develop Data Access Layer	15 days	Fri 10/3/14	Thu 10/23/14	58	TrinityTG .NET Developer
Update Data Tier based upon Design Feedback	5 days	Thu 10/23/14	Wed 10/29/14	54SS	Sverre Schiotz
Submit 4.1 Data Layer - "Empty Database"	1 day	Thu 10/30/14	Thu 10/30/14	62	Greg Harvey
Deliverable Review	10 days	Fri 10/31/14	Fri 11/14/14	63	CEC Staff
Update	3 days	Mon 11/17/14	Wed 11/19/14	64	Sverre Schiotz
Review and Signoff	1 day	Thu 11/20/14	Thu 11/20/14	65	CEC Staff

Task Name	Duration	Start	Finish	Predecessors	Resource Names
4.2 Develop Logic Tier	**88 days**	**Fri 10/24/14**	**Fri 3/6/15**		
Develop Service Layer	10 days	Fri 10/24/14	Thu 11/6/14	61	Amit Rai
Develop Orchestration layer and Integrate Workflow Logic	10 days	Fri 10/24/14	Thu 11/6/14	68SS	TrinityTG .NET Developer
Develop Domain Layer and Integrate Business Rule	29 days	Fri 11/7/14	Mon 12/22/14	69	TrinityTG .NET Developer
Develop Security Model	20 days	Fri 11/7/14	Tue 12/9/14	68	Amit Rai
Develop Data Import	25 days	Tue 12/23/14	Fri 1/30/15	70	TrinityTG .NET Developer
Develop Search Function	15 days	Mon 2/2/15	Mon 2/23/15	72	TrinityTG .NET Developer
Develop Ad-Hoc Reporting	25 days	Thu 11/20/14	Tue 12/30/14	65	Sverre Schiotz
Conduct Unit Testing	20 days	Wed 12/31/14	Thu 1/29/15	74	TrinityTG .NET Developer, Amit Rai
Develop Unit Test Results	10 days	Fri 1/30/15	Thu 2/12/15	75	Amit Rai
Deliverable Review	10 days	Fri 2/13/15	Fri 2/27/15	76	CEC Staff
Review and Signoff	5 days	Mon 3/2/15	Fri 3/6/15	77	CEC Staff, Amit Rai
4.3 Draft Interface Tier	**100 days**	**Thu 10/9/14**	**Mon 3/9/15**		
Develop iRise for Draft Web Pages	10 days	Thu 10/9/14	Wed 10/22/14	53SS	Athina Addison
Deliverable Review	2 days	Thu 10/23/14	Fri 10/24/14	80	CEC Staff
Update	3 days	Mon 10/27/14	Wed 10/29/14	81	Athina Addison
Review and Signoff	5 days	Thu 10/30/14	Wed 11/5/14	82	CEC Staff
Develop Presentation Layer	68 days	Thu 10/30/14	Wed 2/11/15	82	Hemal Mehta
Develop Responsive Page Handling	10 days	Thu 2/12/15	Thu 2/26/15	84	Hemal Mehta
Develop Help	10 days	Tue 2/24/15	Mon 3/9/15	73	TrinityTG .NET Developer
Develop Reports	25 days	Wed 12/31/14	Thu 2/5/15	74	Sverre Schiotz
4.4 Code Review	**78 days**	**Mon 11/3/14**	**Mon 3/2/15**		

Task Name	Duration	Start	Finish	Predecessors	Resource Names
Session 1	1 day	Mon 11/3/14	Mon 11/3/14		Amit Rai
Session2	1 day	Tue 12/2/14	Tue 12/2/14		Amit Rai
Session 3	1 day	Mon 1/5/15	Mon 1/5/15		Amit Rai
Session 4	1 day	Mon 2/2/15	Mon 2/2/15		Amit Rai
Session 5	1 day	Mon 3/2/15	Mon 3/2/15		Amit Rai
5. Test	**222 days**	**Mon 8/11/14**	**Tue 6/30/15**		
5.1 Test Plan	**30 days**	**Mon 8/11/14**	**Mon 9/22/14**		
Develop Test Plan	15 days	Mon 8/11/14	Fri 8/29/14	50	Jessica Hovdesven
Deliverable Review	10 days	Tue 9/2/14	Mon 9/15/14	96	CEC Staff
Updates and Signoff	5 days	Tue 9/16/14	Mon 9/22/14	97	Jessica Hovdesven, CEC Staff
5.2 Integration and System Testing	**192 days**	**Tue 9/23/14**	**Tue 6/30/15**		
Write Scripts	30 days	Tue 9/23/14	Mon 11/3/14	98	Jessica Hovdesven
Conduct System Testing	**45 days**	**Thu 2/12/15**	**Thu 4/16/15**		
Data Submittal	4 days	Thu 2/12/15	Wed 2/18/15	100,84	Jessica Hovdesven, Athina Addison
Account Management	2 days	Thu 2/19/15	Fri 2/20/15	102	Jessica Hovdesven
Bulk Upload	7 days	Mon 2/23/15	Tue 3/3/15	103	Jessica Hovdesven
Appliance Calculations	19 days	Wed 3/4/15	Mon 3/30/15	104	Jessica Hovdesven
Security	2 days	Tue 3/31/15	Wed 4/1/15	105	Jessica Hovdesven
Reports	10 days	Thu 4/2/15	Wed 4/15/15	106	Jessica Hovdesven
Accessibility	1 day	Thu 4/16/15	Thu 4/16/15	107	Jessica Hovdesven
Bug Fix	37 days	Wed 3/4/15	Thu 4/23/15	105SS	Amit Rai, TrinityTG .NET Developer, Hemal Mehta, Sverre Schiotz[25%]
Create System Test Report	1 day	Fri 4/24/15	Fri 4/24/15	109	Jessica Hovdesven

Task Name	Duration	Start	Finish	Predecessors	Resource Names
Deliverable Review	10 days	Mon 4/27/15	Fri 5/8/15	110	CEC Staff
Updates and Signoff	5 days	Tue 5/12/15	Mon 5/18/15	111	CEC Staff, Jessica Hovdesven
5.3 Acceptance Testing	**162 days**	**Tue 11/4/14**	**Tue 6/30/15**		
Develop UAT Plan	10 days	Tue 11/4/14	Tue 11/18/14	100	Jessica Hovdesven
Review UAT Scripts	15 days	Wed 11/19/14	Thu 12/11/14	114	Jessica Hovdesven
Execute UAT	5 days	Tue 5/19/15	Mon 5/25/15	115,112	CEC Staff, Amit Rai
Bug Fix	10 days	Tue 5/26/15	Mon 6/8/15	116	Amit Rai, TrinityTG .NET Developer, Hemal Mehta, Sverre Schiotz[25%]
Develop UAT Report	1 day	Tue 6/9/15	Tue 6/9/15	117	Jessica Hovdesven
Deliverable Review	10 days	Wed 6/10/15	Tue 6/23/15	118	CEC Staff
Updates and Signoff	5 days	Wed 6/24/15	Tue 6/30/15	119	CEC Staff, Jessica Hovdesven
6. Deploy	**187 days**	**Thu 10/30/14**	**Fri 7/31/15**		
6.1 Perform Data Conversion	**184 days**	**Thu 10/30/14**	**Tue 7/28/15**		
Mapping	**40 days**	**Thu 10/30/14**	**Wed 12/31/14**		
Manufacturer Contact Files	5 days	Thu 10/30/14	Wed 11/5/14	62	Sverre Schiotz
Test Lab Database	5 days	Thu 11/6/14	Thu 11/13/14	124	Sverre Schiotz
Enforcement Database	5 days	Fri 11/14/14	Thu 11/20/14	125	Sverre Schiotz
Appliance Testing Database	5 days	Fri 11/21/14	Mon 12/1/14	126	Sverre Schiotz
Appliance Efficiency Database	10 days	Tue 12/2/14	Mon 12/15/14	127	Sverre Schiotz
Produce Data Mapping Report	10 days	Tue 12/16/14	Wed 12/31/14	128	Sverre Schiotz
Extract/Transform	**50 days**	**Fri 1/2/15**	**Mon 3/16/15**		
Manufacturer Contact Files	10 days	Fri 1/2/15	Thu 1/15/15	129	Sverre Schiotz
Test Lab Database	10 days	Fri 1/16/15	Fri 1/30/15	131	Sverre Schiotz

Task Name	Duration	Start	Finish	Predecessors	Resource Names
Enforcement Database	10 days	Mon 2/2/15	Fri 2/13/15	132	Sverre Schiotz
Appliance Testing Database	10 days	Tue 2/17/15	Mon 3/2/15	133	Sverre Schiotz
Appliance Efficiency Database	10 days	Tue 3/3/15	Mon 3/16/15	134	Sverre Schiotz
Validate Test Data and Identify Cleansing Needs	**27 days**	**Tue 3/17/15**	**Wed 4/22/15**		
Manufacturer Contact Files	3 days	Tue 3/17/15	Thu 3/19/15	135	CEC Staff
Test Lab Database	3 days	Fri 3/20/15	Tue 3/24/15	137	CEC Staff
Enforcement Database	3 days	Wed 3/25/15	Fri 3/27/15	138	CEC Staff
Appliance Testing Database	3 days	Mon 3/30/15	Wed 4/1/15	139	CEC Staff
Appliance Efficiency Database	3 days	Thu 4/2/15	Mon 4/6/15	140	CEC Staff
Update ETL Scripts	12 days	Tue 4/7/15	Wed 4/22/15	141	Sverre Schiotz
Perform Mock Data Conversion	**50 days**	**Thu 4/23/15**	**Thu 7/2/15**		
Manufacturer Contact Files	10 days	Thu 4/23/15	Wed 5/6/15	142	Sverre Schiotz
Test Lab Database	10 days	Thu 5/7/15	Thu 5/21/15	144	Sverre Schiotz
Enforcement Database	10 days	Fri 5/22/15	Thu 6/4/15	145	Sverre Schiotz
Appliance Testing Database	10 days	Fri 6/5/15	Thu 6/18/15	146	Sverre Schiotz
Appliance Efficiency Database	10 days	Fri 6/19/15	Thu 7/2/15	147	Sverre Schiotz
Update ETL Scripts	12 days	Mon 7/6/15	Tue 7/21/15	148	Sverre Schiotz
Perform Final Data Conversion	5 days	Wed 7/22/15	Tue 7/28/15	149	Sverre Schiotz
6.2 Train Staff	**48 days**	**Tue 5/19/15**	**Fri 7/24/15**		
6.2 Training Plan Development	**22 days**	**Tue 5/19/15**	**Wed 6/17/15**		
Draft Plan	7 days	Tue 5/19/15	Wed 5/27/15	112	Jessica Hovdesven
Deliverable Review	10 days	Thu 5/28/15	Wed 6/10/15	153	CEC Staff
Updates and Signoff	5 days	Thu 6/11/15	Wed 6/17/15	154	Jessica Hovdesven, CEC Staff

Task Name	Duration	Start	Finish	Predecessors	Resource Names
6.3 Training Materials	**30 days**	**Thu 5/28/15**	**Thu 7/9/15**		
Develop Materials	15 days	Thu 5/28/15	Wed 6/17/15	154SS	Jessica Hovdesven
Deliverable Review	10 days	Thu 6/18/15	Wed 7/1/15	157	CEC Staff
Updates And Signoff	5 days	Thu 7/2/15	Thu 7/9/15	158	Jessica Hovdesven, CEC Staff
6.4 Training Sessions	**11 days**	**Fri 7/10/15**	**Fri 7/24/15**		
1st Live Session	0.5 days	Fri 7/10/15	Fri 7/10/15	159	Jessica Hovdesven
2nd Live session	0.5 days	Fri 7/24/15	Fri 7/24/15	161FS+10 days	Jessica Hovdesven
6.4 Finalize System For Deployment	**22 days**	**Tue 6/30/15**	**Fri 7/31/15**		
Submit 6.5 Final Web Pages	0 days	Tue 6/30/15	Tue 6/30/15	120	Amit Rai
Submit 6.6 Integration System into Production	2 days	Wed 7/1/15	Thu 7/2/15	164SS	Amit Rai
Webmaster Verification	10 days	Mon 7/6/15	Fri 7/17/15	165	CEC Staff
CEC Review Period	20 days	Mon 7/6/15	Fri 7/31/15	166SS	CEC Staff
Concurrent Updates/Fixes	20 days	Mon 7/6/15	Fri 7/31/15	167SS	Amit Rai, Jessica Hovdesven, Hemal Mehta, Sverre Schiotz
Go Live	0 days	Fri 7/31/15	Fri 7/31/15	167	
6.7 Final System Transition, Warranty, & Final Acceptance	**82 days**	**Mon 8/3/15**	**Mon 11/30/15**		
6.5 Provide Warranty Service	82 days	Mon 8/3/15	Mon 11/30/15	169	Sverre Schiotz[40%], Jessica Hovdesven[40%], TrinityTG .NET Developer[40%]
6.3 Conduct Knowledge Transfer	**77 days**	**Mon 8/3/15**	**Thu 11/19/15**		
Monthly Session 1	1 day	Mon 8/3/15	Mon 8/3/15	171SS	Amit Rai, Sverre Schiotz, Hemal Mehta
Monthly Session 2	1 day	Fri 9/18/15	Fri 9/18/15		Amit Rai, Sverre Schiotz, Hemal Mehta
Monthly Session 3	1 day	Fri 10/16/15	Fri 10/16/15		Amit Rai, Sverre Schiotz, Hemal Mehta
Monthly Session 4	1 day	Thu 11/19/15	Thu 11/19/15		Amit Rai, Sverre Schiotz, Hemal Mehta

8. Response to all Requirements

This section presents the TrinityTG/C&G Team response to the requirements. Mandatory Scored narrative responses are presented at the end of the requirements tables, with page numbers referenced in the tables where appropriate.

Technical Requirement: Database Contents

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
1.1	• The system shall store appliance listings o Listings that are edited or deleted must be handled by archiving the original listing	M	Yes	
1.2	• The system shall store contact information for customers (certifiers, manufacturers, test laboratories)	M	Yes	
1.2a	o The system shall be able to store international addresses and phone numbers	M	Yes	
1.3	• The system shall store approval status for test laboratories and third party certifiers (current and past)	M	Yes	
1.4	• The system shall store authorization status for third party certifiers that have been given authority by a manufacturer to act on that manufacturer's behalf	M	Yes	
1.5	• The system shall store submittal log information resulting from submittals from customers	M	Yes	
1.6	• The system shall store enforcement log information generated by staff	M	Yes	
1.7	• The system shall be designed with database-centric architecture, meaning that the system shall employ a standard, general purpose database management system and shall use table-driven logic for data validation o The system shall employ a generalized architecture to enhance the ability of the system to be maintained, altered, updated, and/or cloned and repurposed (e.g., for an appliance rebate program)	M	Yes	

Technical Requirement: Automation Functions

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
2.1	• The system shall have automated logging and tracking of new submittals made through its web-based interface	M	Yes	
2.1a	o The system shall automatically track staff activity, such as who reviewed and processed a submittal and when the submittal was closed, or who deleted a record from the system and when it occurred.		Yes	
2.2	• The system shall perform automated "first stage" formatting validation, which will apply when a submitter attempts to submit materials to the system	M	Yes	
2.2a	o Formatting validation shall check to see that all required fields are entered, that the correct type of information is present in each field (i.e., no letter characters in numeric fields), and that the number of characters entered into a field do not exceed the width of that field	M	Yes	
2.2b	o Formatting validation shall also sanitize all input, eliminating any risk of SQL-injection or similar attacks. As a part of this, numeric data shall be automatically rounded to the appropriate number of decimal places for the field, if excess additional digits are provided	M	Yes	
2.2c	o Submitters shall be prevented from submitting materials until they have corrected any errors caught by the formatting validation ▪ The system shall highlight improper entries and provide guidance to the submitter on correcting their data entry (e.g., "This field is required." or "Only numbers may be entered in this field.")	M	Yes	
2.3	• The system shall perform automated "second stage" validation against regulatory standards after submittal to the system	M	Yes	
2.3a	o Regulatory validation shall compare the provided information against the requirements of applicable regulations	M	Yes	

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
2.3b	o The results of second stage validation will be shown to staff (not to customers) as a part of staff's review and approval of submitted materials	M	Yes	
2.3c	o Items that are flagged as failing second stage validation should be highlighted when shown during staff review, and should include an explanation of the condition(s) that caused the failure (i.e., submitted annual energy use exceeds the standard of 299 kWh/yr).	M	Yes	

Technical Requirement: General User Interface Requirements

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
3.1	• The system shall provide the look and feel of systems that support comparable Energy Commission systems and adhere to any standards set by the IT Services Branch.	M	Yes	
3.2	• The system shall provide Help functionality on each displayed page, with topics sensitive to the page context.	M	Yes	
3.3	• The system shall display a warning to the user if any current displayed information will be lost or deleted upon navigation to another form or screen.	M	Yes	
3.4	• The system shall provide action-specific confirmation messages (e.g., "Are you sure you want to delete this record?").	M	Yes	
3.5	• The system shall prompt system users when a user action will result in an irreversible change.	M	Yes	
3.6	• The system shall incorporate easily understood error, edit, and confirmation messages.	M	Yes	
3.7	• The system shall update the database at the time the user submits the data.	M	Yes	
3.8	• The system shall be a scalable system to accommodate future enhancements.	M	Yes	
3.9	• The system shall comply with California Government Code Section 11135 and Section 508 of the federal Rehabilitation Act of 1973.	M	Yes	

Technical Requirement: Appliance Data Viewing/Publishing Tools

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
4.1	• The system shall be able to publicly display active appliance listings using interactive web pages o The system shall not display a listing prior to its "Display by" date	M	Yes	
4.2	• The system shall be able to publicly display archived (historic) listings using interactive web pages	M	Yes	
4.2a	o The historic data pages shall be separate from active listing data pages to prevent confusion	M	Yes	
4.2b	o The historic data pages shall be clearly marked or displayed as "Historic", or similar terms or phrases communicating that the records are not current.	M	Yes	
4.3	• The interactive web pages shall include or incorporate a "Browse Listings" function for walking through the listings in the Appliance Efficiency Database	M	Yes	
4.4	• The interactive web pages shall include or incorporate a "Find model number" function for allowing a heuristic search across appliance types for an entered model number.	M	Yes	
4.4a	o The "Find model number" function shall be able to return both exact and near matches	M	Yes	
4.4b	o The "Find model number" function shall be able to use wildcards in queries	M	Yes	
4.4c	o The "Find model number" function shall be able to appropriately recognize wildcards in stored appliance model numbers	M	Yes	
4.5	• The interactive web pages shall include or incorporate a "Quick Search" function for queries based on simple information such as appliance type, brand, model number, or the presence of certain basic features	MS	Yes	8-18
4.6	• The interactive web pages shall include or incorporate a "Search By…", "Advanced Search", or similar function allowing the creation of advanced queries on any/all non-administrative data columns available for an appliance type	MS	Yes	8-18

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
4.7	• The interactive web pages shall include or incorporate the ability to export the results of a query or search to an appropriate type of file (Excel, CSV, etc.) o This includes "unfiltered" exports returning all records of a given appliance type	MS	Yes	8-19
4.8	• For results of browsing, quick search, or advanced search, a number of individual listings (no fewer than five) may be selected or highlighted to include in a "Compare" function, showing side-by-side extended information about the selected models	M	Yes	
4.9	• An individual appliance listing shall be selectable and displayed on a separate page o Individual appliance listing pages shall have unique http:// addresses that can be bookmarked and returned to	M	Yes	
4.9a	o Entering an address for a listing shall not cause a display of a listing before its "Display by" date.	M	Yes	

Technical Requirement: Approval Information Viewing/Publishing Tools

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
5.1	• The system shall publicly display a list of currently approved test laboratories and third party certifiers	M	Yes	
5.2	• The system shall publicly display lists of previously approved test laboratories and third party certifiers, organized by year	M	Yes	
5.2a	o The prior year lists shall be located on a page that is separate from currently approved entities to prevent confusion	M	Yes	
5.2b	o The prior year lists shall be clearly marked or displayed as "Previously approved"	M	Yes	

Technical Requirement: Staff Data Acceptance and Curation Tools and Interface

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
6.1	• The system shall provide the following tools to Energy Commission staff for processing submittals made by customers:	MS	Yes	8-19 through 8-20
6.1a	o "Inbox" display of received submittals (appliance listings and/or approval applications) in queue for review ▪ Each submittal in queue shall be logged in as described under Automated Functions ▪ Maintaining log number for same submittal throughout process ▪ Highlighting of any submittals made by or involving a customer linked to an enforcement log	MS	Yes	8-19 through 8-20
6.1b	o "Outbox" display of previously handled submittals	MS	Yes	8-20
6.1c	o "Review" display of a selected submittal ▪ For submittals of appliance listings, highlighting of any data validation violation with explanation (e.g., submitted data shows the appliance does not meet a required standard)	MS	Yes	8-20 through 8-21
6.2	• The "Review" display shall allow staff to approve submittals or return them for correction	M/MS	Yes	8-21 through 8-23
6.2a	o The system shall send an automated acceptance notification for approved submittals	M	Yes	
6.2b	o The system shall allow staff to compose and send a response to the manufacturer explaining the reason for rejection (for returned materials) from either the Review page or a subsequent page	MS	Yes	8-21 through 8-23
6.3	• The system shall provide the following tools to Energy Commission staff for curating the stored data and validation rules:	M	Yes	
6.3a	o An interface for establishing and updating the second-stage validation rules ▪ This interface shall present table-driven validation in a staff-editable format. Staff shall not need to know a programming language to understand	M	Yes	

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
	or to edit validation rules. The interface shall include appropriate "rule builder" tools, and shall include language highlighting similar to a modern compiler. Different rules can be specified to apply based on date of submittal (i.e., "Date <" or "Date >=" can be a criteria for a rule), in addition to other criteria. The following additional functions shall be included in the validation interface or in a page accessible from the interface: • A sub-interface for editing column headers, column labels, column data types (Boolean, numeric, etc.), and column widths • A sub-interface for adding/editing stored lookup table values			
6.3b	o An interface for performing queries directly on the database (i.e., for an SQL database, an interface for entering SQL commands and queries). ▪ Commands not needed for curating data or generating lists/reports (i.e., Drop Table) shall be restricted and unable to be performed in this interface	M	Yes	
6.3c	o An interface for staff to add/import new listings or updates to existing listings, separate from the interfaces for review of received submittals ▪ This shall be the same interface as is used by outside certifiers to upload data, but tailored to staff work in the following ways: • Will display both first and second stage validation • Allows staff to override validation and to freely specify the manufacturer, tester, and certifier as appropriate	M	Yes	
6.3d	o An interface for performing simple edits to appliance listings without using the direct access interface	M	Yes	

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
	▪ This interface shall also allow staff to archive listings and restore listings from archive ▪ Staff should be able to select model listings in a fashion similar to use of the "Compare" function, but instead passing the selected listings to this interface ▪ This interface may be combined with the staff interface for adding or updating listings			
6.3e	o An interface for querying and editing contact information and approval status of customers, including the ability to add a new customer account and disable an existing customer account	M	Yes	
6.4	• Staff permissions levels that can be assigned to individual staff members, as follows: 1. Compliance tool access, allowing use of "Inbox", "Outbox", and "Review" tools 2. Curation tool access, adding access to data adding and editing tools 3. Enforcement tool access, adding access to the enforcement log 4. Direct data access, adding access to the SQL interface for the database 5. Admin access, allowing access to all tools, access to the validation rules interface, and the ability to create additional user accounts and assign permissions	M	Yes	

Technical Requirement: Staff Work Tracking and Enforcement Tools

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
7.1	• The system shall include tools for generation of statistics and reports on the number of approval applications and appliance data submittals received	M	Yes	
7.1a	o These reports shall include the total number of submittals, as well as the total number of individual appliance listings submitted and processed	M	Yes	

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
7.1b	o These reports shall also include tracking and reporting of persons approving and denying applications and submittals (i.e., number processed by a given person for a given period)	M	Yes	
7.2	• The system shall allow the extraction and export of contact information by staff in a format suitable for use in mass communications (such as mass e-mail, labels for printed mail, and mail merge functions for letters) and for sharing with the Energy Commission's mail room	M	Yes	
7.3	• The system shall allow for the creation of an "enforcement log" or "enforcement file" able to include/link to/point to specific manufacturers, test laboratories, certifiers, and/or appliance listings	M	Yes	
7.3a	o The system shall allow staff to append notes and attach relevant information and additional files to the enforcement log, without directly affecting the contact information or appliance listings referenced by the log	M	Yes	
7.3b	o The system shall allow staff to flag a given party with an open enforcement matter and send an automatic notification to staff when a "flagged" party has submitted new information to the database.	M	Yes	
7.4	• The system shall allow scheduling of reports and exports to occur automatically at specified dates, times, and intervals o This includes scheduling of the automatic data exports described under "Database Interconnection Tools"	M	Yes	

Technical Requirement: Customer Submittal Web Pages and Tools

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
8.1	• The system shall allow customers to request or otherwise set up a new account	M	Yes	
8.1a	o Creation of a new account shall require provision of complete contact information, including company name, complete	M	Yes	

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
	mailing address, e-mail address, and telephone number			
8.1b	o Customers shall also be able to provide a fax number and a website as a part of their contact information	M	Yes	
8.1c	o Customers shall be able to specify additional contact persons at the same company name and address with separate phone numbers, e-mail addresses, log-in names, and passwords	M	Yes	
8.1d	o The system shall reject the creation of a new account with company name and address information matching an existing account, and shall inform the customer that the account they are attempting to create already exists	M	Yes	
8.2	• The system shall allow customers to securely log in to their account	M	Yes	
8.3	• The system shall allow customers to recover a user name or reset a password using an automated tool	M	Yes	
8.4	• The system shall allow customers, on log-in, to accomplish the following tasks through interactive web pages:	M/MS	Yes	8-24 through 8-26
8.4a	o Update their stored contact information	M	Yes	
8.4b	o Securely submit new appliance listings and/or updates to listings ▪ Customers shall be able to enter appliance data directly into an appropriate web interface or choose to upload data from a pre-formatted spreadsheet file ▪ Customers shall also complete an electronic Declaration as a part of submitting or updating appliance listings	MS	Yes	8-24 through 8-26
8.4c	o Apply for approval as a Test Laboratory	M	Yes	
8.4d	o Apply for approval as a Third Party Certifier	M	Yes	
8.4e	o Delegate Certification Authority to a Third Party	M	Yes	
8.4f	o View and interact with active listings associated with their login (i.e., for which	M	Yes	

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
	the customer is either the manufacturer, certifier, or tester) ▪ Interaction, in this context, means being able to pass selected records into the interface for submitting data, such that the records can be easily updated by the manufacturer, and to separately mark the records for removal from the active listings and archiving in the historic listings.			
8.4g	o View and interact with recent submittal logs, both pending and responded to, associated with their login (i.e., for which the customer is either the manufacturer, certifier, or tester) ▪ Manufacturers shall have some capacity to open, review, and make corrections to their submittals.	M	Yes	
8.4h	o Edit or delete listings for which the customer is either the manufacturer or has been delegated certification authority by the manufacturer	M	Yes	
8.4i	o Receive and view notification of approved applications, accepted appliance listings, or for any material returned for correction ▪ Notifications related to their submittals will be sent to the e-mail addresses provided in the submittal, and be additionally visible or accessible from or within their "My Account" page.	M	Yes	
8.5	• The system shall use secure digital signatures for all forms o Digital signatures must comply with Government Code 16.5 and Title 2, California Code of Regulations, Division 7, Chapter 10 (beginning with Section 22000)	M	Yes	
8.6	• The text content of the web pages shall be in a format that does not prohibit the later development of alternate language versions of customer web pages o Development of alternate language versions of web pages are outside of the scope of this solicitation	M	Yes	

Technical Requirement: System Security

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
User Authentication and Profile:		M	**Yes**	
9.1a	Require a unique login (UserID) when establishing a user profile.	M	Yes	
9.1b	Email address may be used as a UserID or another unique identifier.	M	Yes	
9.1c	Users must enter and confirm a password per password security requirements below.	M	Yes	
9.1d	Require an authentication check box to agree to terms of use (e.g., a user confirms entered data is complete and correct upon submittal).	M	Yes	
9.1e	To register for a new account, the system must verify ownership of the email address by sending an automatic email to the email address provided. The user will be required to click on a link in the registration email to complete the registration process.	M	Yes	
9.1f	Authenticate against the user profile for each session.	M	Yes	
9.1g	Provide a process for a user to define and maintain their user profiles.	M	Yes	
9.1h	Capture an email account for each user profile for all communication regarding account changes.	M	Yes	
9.1i	Utilize existing Active Directory (AD) authentication to enable single sign-on for internal Energy Commission staff.	M	Yes	
Role-Based Authorization:		M	**Yes**	
9.2a	Apply roles-based security throughout the application.	M	Yes	
9.2b	Allow users to have multiple roles.	M	Yes	
9.2c	Allow Energy Commission staff, with appropriate security permissions, the ability to establish user authorizations (e.g., full admin, partial edit, read only access to designated functions).	M	Yes	
9.2d	Maintain secured role-based user authorization levels and restrict access at the report, file, table, screen, and field level based on user authorization.	M	Yes	
9.2e	Provide the ability to configure access to data, report generation, and distribution (e.g., security	M	Yes	

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
	model of user roles and privileges) by user, role, program, and facility, etc.)			
9.2f	Support database level security in combination with the role-based security at the table, record, and field level.	M	Yes	
User Privacy Agreement:		M	**Yes**	
9.3a	Require a privacy agreement statement and check box be presented to the user to agree to the privacy terms of use.	M	Yes	
Password Security		M	**Yes**	
9.4a	Salted hash passwords shall be stored encrypted in the system.	M	Yes	
9.4b	Credentials must be stored after being one-way hashed and salted using acceptable hashing algorithms.	M	Yes	
9.4c	A strong standard encryption algorithm must be used.	M	Yes	
9.4d	Password length shall be a minimum of 10 characters.	M	Yes	
9.4e	Passwords must contain at least one of each of the following: • Alpha (at least one upper and lower case) • Numeric • Special Character	M	Yes	
9.4f	Passwords shall be easily changed.	M	Yes	
Login:		M	**Yes**	
9.5a	Require SSL for entering UserID and Password.	M	Yes	
9.5b	Provide for secure access to the system for protecting transmitted information.	M	Yes	
9.5c	System must not possess “remember me” functionality.	M	Yes	
Logon Attempts:		M	**Yes**	
9.6a	System shall allow for at least 5, but no more than 8 unsuccessful attempts.	M	Yes	
9.6b	System shall not display the number of login attempts remaining until the final attempt.	M	Yes	
9.6c	System shall display a notice when an unsuccessful sign-on attempt occurs. The message shall be generic as to provide no	M	Yes	

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
	information as to if an account exists or password is wrong.			
9.6d	System shall present a message to non Energy Commission users informing them they are locked out for a specific time (e.g., 15 minutes, 30 minutes) or present the user with an alternative means of signing into the application (e.g., forgotten password) which meets all State Office of Information Security policies and guidelines and complies with Section 508, Subpart B, Subsection 1194.22, Guidelines A-P of the Rehabilitation Act of 1973 as revised in 1998.	M	Yes	
Password Recovery:		M	**Yes**	
9.7a	Provide a secure process that allows a user to obtain a forgotten UserID.	M	Yes	
9.7b	Provide a secure process that allows a user to reestablish a password.	M	Yes	
9.7c	Provide for a security question to authenticate users when a UserID or password is forgotten.	M	Yes	
9.7d	User is emailed a temporary password and is required to change password at login.	M	Yes	
System Logout:		M	**Yes**	
9.8a	System shall have an effective logout button on every single page in a common location.	M	Yes	
9.8b	Automatically logout the user after the browser has been closed.	M	Yes	
9.8c	Logout a user when there has been no activity for a configurable amount of time. Generally, timeout will be after 10-15 minutes.	M	Yes	
Acceptable Files for Upload:		M	**Yes**	
9.9a	System shall only allow files for upload that contain acceptable file extensions as defined by the Energy Commission Information Security Officer.	M	Yes	
Malware Protection:		M	**Yes**	
9.10a	System shall perform a virus scan on any files from outside sources prior to uploading or processing them and reject any files found with any type of virus, malware, Trojan house, etc.	M	Yes	
Audit Trail and Logs:		M	**Yes**	

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
9.11a	Provide an audit trail to track changes to data or tables, including who made the change, date/time of change, and what change was made.	M	Yes	
9.11b	Provide an error log for analysis.	M	Yes	
9.11c	Use rolling logs to prevent disk storage over capacity.	M	Yes	
9.11d	Allow Energy Commission staff, with appropriate security permissions, the ability to modify log analysis criteria.	M	Yes	
System Administrator:		M	**Yes**	
9.12a	Allow System Administrator to update select system security configurations as appropriate.	M	Yes	
9.12b	Automatically back-up production system periodically as defined by the System Administrator.	M	Yes	
Secure Coding Practices:		M	**Yes**	
9.13a	Coding shall follow security best practices to reduce the risk of applications being exploited and attacked. The Open Web Application Security Project (OWASP) provides best practice guidelines.	M	Yes	
9.13b	Security shall be integrated into the development, verification and maintenance processes.	M	Yes	
9.13c	Source code shall not include any credentials, including (but not limited to) usernames, passwords, certificates, token IDs, or phone numbers.	M	Yes	
9.13d	Code may be required to be tested by analytics and security software tools such as AppScan, Vericode, Indihiang or other approved third party software tools.	M	Yes	

Technical Requirement: Database Interconnection Tools

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
10.1	• The system shall be able to accept an automated export file from a similar appliance database o Staff shall be able to define the expected format and column headings of an anticipated incoming file and create a	M	Yes	

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
	protocol for matching the columns in the incoming data to the columns in our data tables, in (i.e., create and save a profile for reading transmitted data)			
10.2	• The system shall be able to transmit an automated export of our data to a similar appliance database o Staff shall be able to define a format for the data being exported and transmitted, including substitutions for column headers (i.e., create and save a profile for composing data for an external database)	M	Yes	
10.3	• The system shall be able to transmit stored form information, including digital signature information	M	Yes	
10.4	• The system shall be able to receive transmitted form information, including digital signature information	M	Yes	

Technical Requirement: Mobile and In-Store Outreach Tools

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #
11.1	• Mobile versions of the data viewing pages shall be created	M	Yes	
11.1a	o These pages shall automatically load in place of regular pages when accessed from a mobile device.	M	Yes	
11.1b	o A link for accessing the desktop version of the page shall be included somewhere on each mobile page	M	Yes	
11.1c	o Basic search functions shall be available and functional on mobile devices	M	Yes	
11.2	• The page used to display an individual appliance listing shall automatically generate a QR code that encodes the unique http:// address for that listing o This QR code shall allow for a mobile device to scan a printout of the code and be immediately taken to the relevant appliance listing via the encoded link	NMS	Yes	8-27

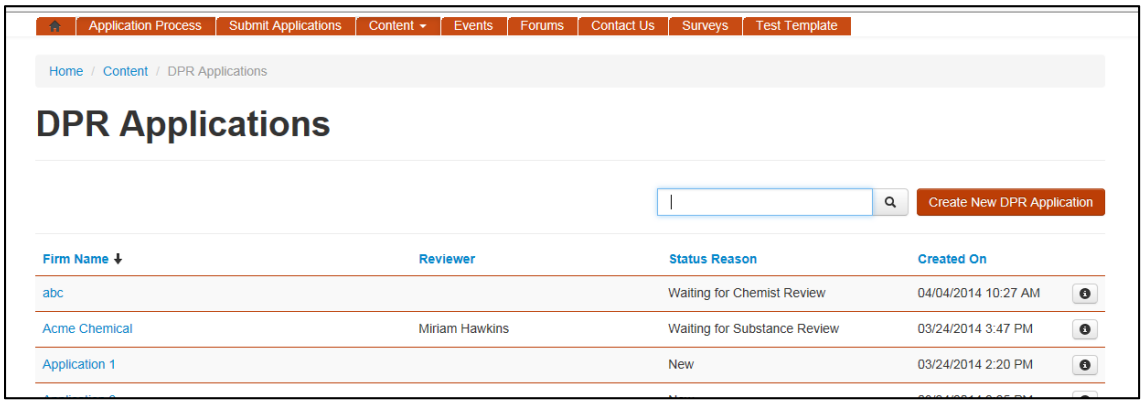
1.1 PROJECT TEAM QUALIFICATIONS

Req. #	Requirement Description	Scoring	Meets (Yes/No)	Proposal Page #s
Developers:				
12.1	• Experience as a Senior Level Programmer in a large (1,000,000+ records) enterprise data system o Minimum 3 years	MS	Yes	9-2 through 9-20
12.2	• Skilled in Javascript and JQuery	MS	Yes	9-2 through 9-20
12.3	• Skilled in CSS3	MS	Yes	9-2 through 9-20
12.4	• Skilled in Cross-Browser Development	MS	Yes	9-2 through 9-20
12.5	• Skilled in import of records from spreadsheet to database	MS	Yes	9-2 through 9-20
12.6	• Experience in ASP .NET Webforms o Minimum 5+ years	MS	Yes	9-2 through 9-20
12.7	• Experience in SQL Server databases o Minimum 5+ years	MS	Yes	9-2 through 9-20
12.8	• Experience in User Interface Design / designing interfaces for usability o Minimum 2+ years	MS	Yes	9-2 through 9-20
12.9	• Strong background with development in Microsoft SQL Server 2008 R2 o Minimum 2+ years	MS	Yes	9-2 through 9-20
12.10	• Strong background with report development using SQL Server 2008 R2 Reporting Services (SSRS) o Minimum 2+ years	MS	Yes	9-2 through 9-20
12.11	• Strong background with using SQL Server 2008 R2 Integration Services (SSIS) o Minimum 2+ years	MS	Yes	9-2 through 9-20
12.12	• strong background with ASP.NET 4.0 using Visual Studio 2010 o Minimum 2+ years	MS	Yes	9-2 through 9-20
Project Lead: (same as above except the following changes)				
12.13	• Project Management experience in at least two projects of similar size and scope (or larger) o Minimum 3 years o PMP Project Management certification: include certification number in resume materials	MS	Yes	9-2 through 9-7
12.14	• Experience as a Senior Level Programmer in a lead capacity for a large (1,000,000+ records) enterprise data system o Minimum 5 years	MS	Yes	9-2 through 9-7

Mandatory Scored Responses

4.5 The interactive web pages shall include or incorporate a "Quick Search" function for queries based on simple information such as appliance type, brand, model number, or the presence of certain basic features

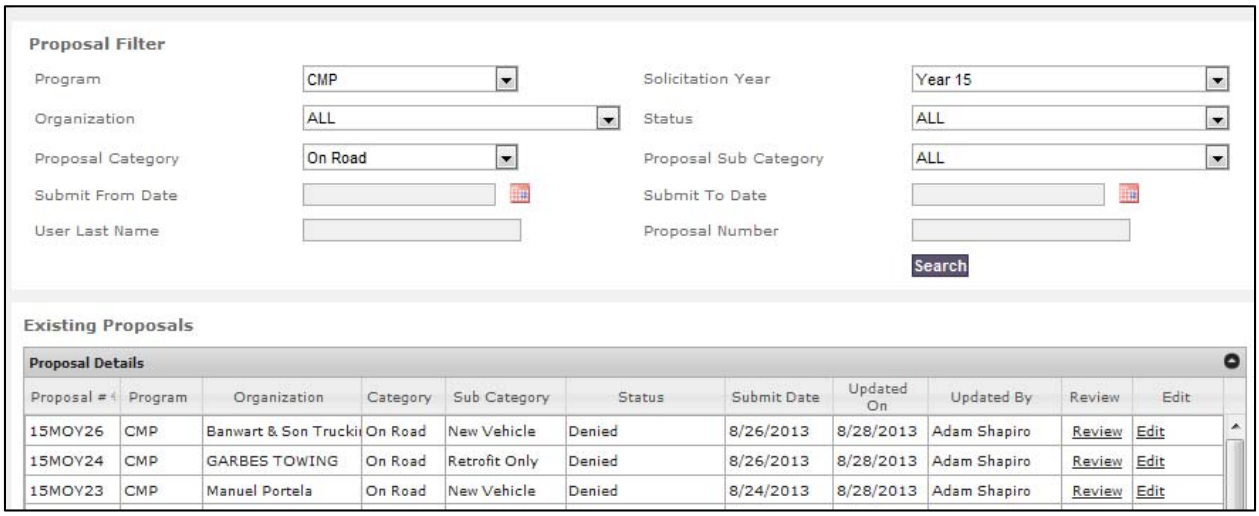
Where appropriate, the UI will have a quick search field that is used to filter results based on a predefined set of "key" indicators such as the ones mentioned in the requirement. The quick search box is typically implemented at or near the top of the page and is used predominantly in screens where the user is presented with multiple records of data:



As shown in the above example, the quick search consists of a single text box with a Search icon to denote its function to the user. When the user enacts a quick search, it will filter the result set based upon the search criteria.

4.6. The interactive web pages shall include or incorporate a "Search By…", "Advanced Search", or similar function allowing the creation of advanced queries on any/all non-administrative data columns available for an appliance type.

For pages that have columnar data for appliances, we will provide the user with a series of filtering fields that allow them to conduct a more distinct search of the data. A similar implementation of this type of functionality is displayed below:



The Advanced Search capabilities can include text fields, drop down values, and date range filters to correspond with the columnar data presented to the user. For drop-down values, they

can be inter-related so that when a drop down value is selected in one filter criteria, the remaining drop downs filter based upon the allowed or appropriate values relative to the one first selected.

4.7 The interactive web pages shall include or incorporate the ability to export the results of a query or search to an appropriate type of file (Excel, CSV, etc.) This includes "unfiltered" exports returning all records of a given appliance type

The ASP.NET UI Controls for grid views can be developed to include export capabilities. The export works based upon actual values shown in the grid. This means users can either export the full unfiltered result set, or they can export the filtered view based upon the advanced search criteria. Excel would be the default export format, as this is commonly used by users for working with downloaded or filtered data.

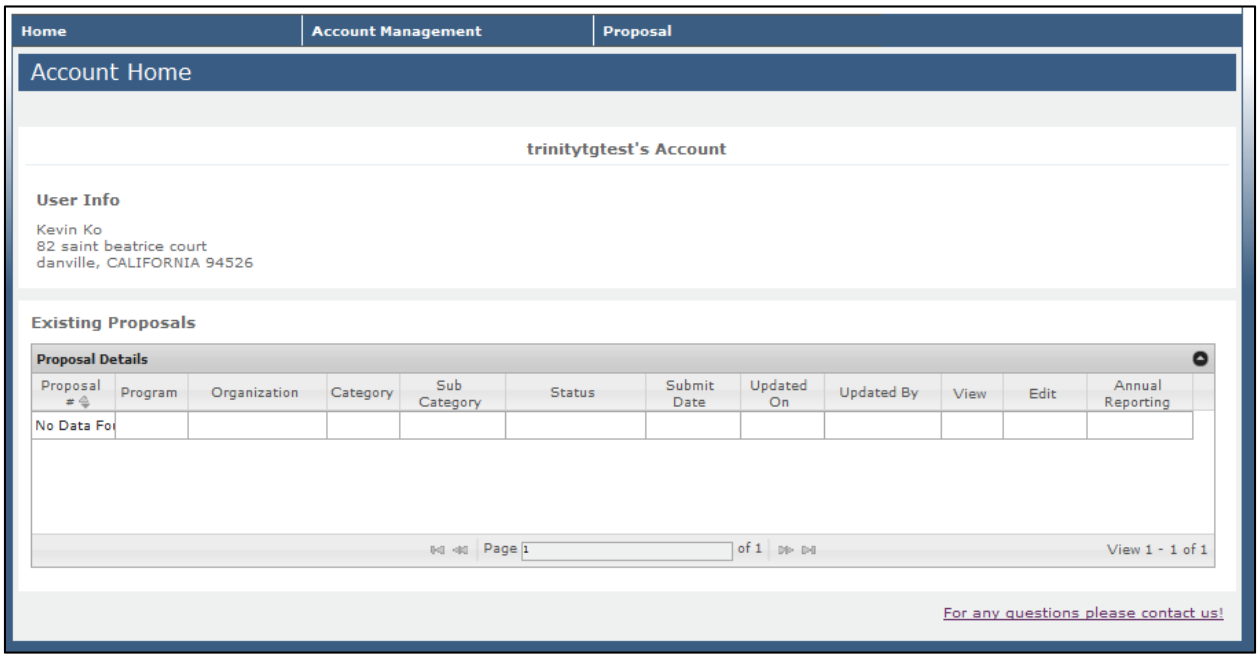
Because this feature is part of the UI control set, it can be deployed for use across all grid views in the application.

6.1 The system shall provide the following tools to Energy Commission staff for processing submittals made by customers:

6.1a Inbox" display of received submittals (appliance listings and/or approval applications) in queue for review:

- ***Each submittal in queue shall be logged in as described under Automated Functions***
- ***Maintaining log number for same submittal throughout process***
- ***Highlighting of any submittals made by or involving a customer linked to an enforcement log***

Our design approach for an Inbox is based upon a system we implemented at the Bay Area Air Quality Management District. That system, which supports incoming grant applications from regional businesses, presents incoming registrations in a single grid view that's accessible to the various users. The list of registrations presented to the user is based upon security role. For example, if a single staff person has access just to registrations assigned to them, they will see a view like the one shown below:



The grid view is limited to just those records assigned to him/her (in the above sample the worker does not have any registrations assigned to them.

But a manager or supervisor would have an expanded view that includes not only registrations assigned to them, but assigned to other staff:

Existing Proposals

Proposal Details

Proposal #	Program	Organization	Category	Sub Category	Status	Submit Date	Updated On	Updated By	Review	Edit
15MOY26	CMP	Banwart & Son Truckii	On Road	New Vehicle	Denied	8/26/2013	8/28/2013	Adam Shapiro	Review	Edit
15MOY24	CMP	GARBES TOWING	On Road	Retrofit Only	Denied	8/26/2013	8/28/2013	Adam Shapiro	Review	Edit
15MOY23	CMP	Manuel Portela	On Road	New Vehicle	Denied	8/24/2013	8/28/2013	Adam Shapiro	Review	Edit
15MOY21	CMP	Roger Hall Live Stock	On Road	Retrofit Only	Denied	8/24/2013	8/26/2013	Adam Shapiro	Review	Edit
15MOY17	CMP	chamkaur singh sidhu	On Road	New Vehicle	Denied	8/12/2013	8/15/2013	Adam Shapiro	Review	Edit
15MOY13	CMP	chamkaur singh sidhu	On Road	New Vehicle	Denied	8/7/2013	12/12/2013	chamkaur sidhu	Review	Edit
15MOY11	CMP	IVALEKA LLC	On Road	New Vehicle	Denied	8/6/2013	8/12/2013	Adam Shapiro	Review	Edit
15MOY10	CMP	Shawn McCord DBA S	On Road	New Vehicle	Denied	8/3/2013	8/7/2013	Adam Shapiro	Review	Edit
	CMP	Haverton Hill LLC.	On Road	New Vehicle	Creation In Progress		8/1/2013	Joe Adiego	Review	Edit
	CMP	Gordon Hodges dba H	On Road	New Vehicle	Creation In Progress		8/2/2013	Gordon Hodges	Review	Edit
	CMP	S J Rodrigues Transpo	On Road	Retrofit Only	Creation In Progress		8/5/2013	Silvino Rodrigues	Review	Edit
	CMP	Kriss Transporation	On Road	New Vehicle	Creation In Progress		8/5/2013	Krishneel Mudaliai	Review	Edit
	CMP	Transport Products U	On Road	New Vehicle	Creation In Progress		9/6/2013	Randy Larson	Review	Edit
	CMP	ABI	On Road	New Vehicle	Creation In Progress		8/6/2013	Michael Olvera	Review	Edit
	CMP	CHammond Construct	On Road	New Vehicle	Creation In Progress		8/7/2013	CHammond Const	Review	Edit
	CMP	CHammond Construct	On Road	New Vehicle	Creation In Progress		8/7/2013	CHammond Const	Review	Edit

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Note that the sample includes a unique identifier that persists throughout the system. This enables uniqueness and data integrity across the system. Also built into this inbox is a feature where individual line items can be highlighted in red to denote a certain condition. This logic is what would be used to show a relationship to an enforcement log history record.

6.1b Outbox" display of previously handled submittals

As noted in the sample above, our design includes a "status" column for showing what state any given registration is in. With this approach, we are able to show both pending and completed submittals in the same view, and giving users the option of filtering or sorting by status. In effect, the Inbox and Outbox are substantially the same screen. While this bears some risk of having a long list of submittals, this approach is made possible by the role-based security filtering we build into the system. Most users will only see their own current and historical record, which drastically reduces the number of records they would see and work with.

6.1c Review" display of a selected submittal. For submittals of appliance listings, highlighting of any data validation violation with explanation (e.g., submitted data shows the appliance does not meet a required standard)

When a user click on the "review' link for record, they will be taken to the detail review page, which includes multiple tabs depicting the various steps in the review process. This design approach is discussed in Section 3.

But for showing individual data validation values, we include a page in the review workflows that shows data from the registrant in a grid view by value:

Engine Info

Description	Existing Main Engine	New/Replacement Engine	Retrofit Engine
Engine Type			
Fuel Type			
Engine Make			
Engine Model			
Engine Model year			
Engine Tier			
Horesepower			
Retrofit Device ARB Number			
New Engine/Equipment Cost ($)			
New Engine Installation Cost ($)			
Retrofit Device & Parts cost ($)			
Retrofit Device Installation Cost ($)			
Total Cost ($)			
Percentage Operation in CA			
Engine Location			
Fuel Consumption Rate			

Project Info

% Operation in District

AB1390

Calculation Base: Mileage

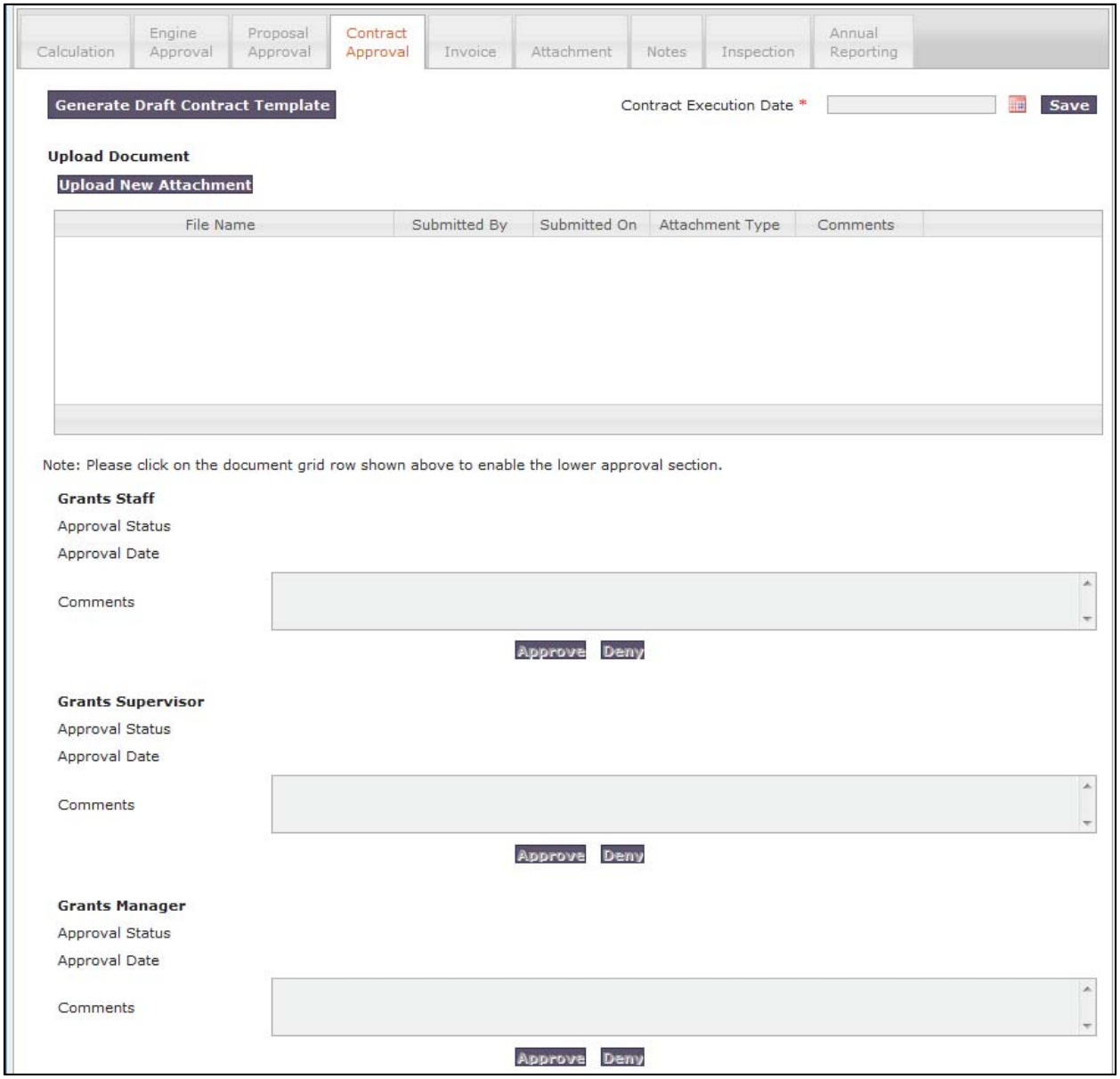
	Fuel (gal/yr)	Mileage (miles/yr)	Hours (hrs/yr)
Estimated Annual Future Usage			
This Year			
2013			
2012			
Calculated Usage	0.00	0.00	0.00

In the above grid, individual values can be highlighted to show any data that does not meet threshold values, does not meet certain validation standards, or other checkpoints that CEC wishes to see. But it is important to note that this would not include basic data validation errors like data type, format or mismatched values. These types of data validation would be handled up front by the web pages, and/or the bulk data upload tool, helping to reduce the degree of review CEC staff will need to conduct, and allow staff to focus on the more qualitative aspects of the submittal review process.

6.2 The "Review" display shall allow staff to approve submittals or return them for correction

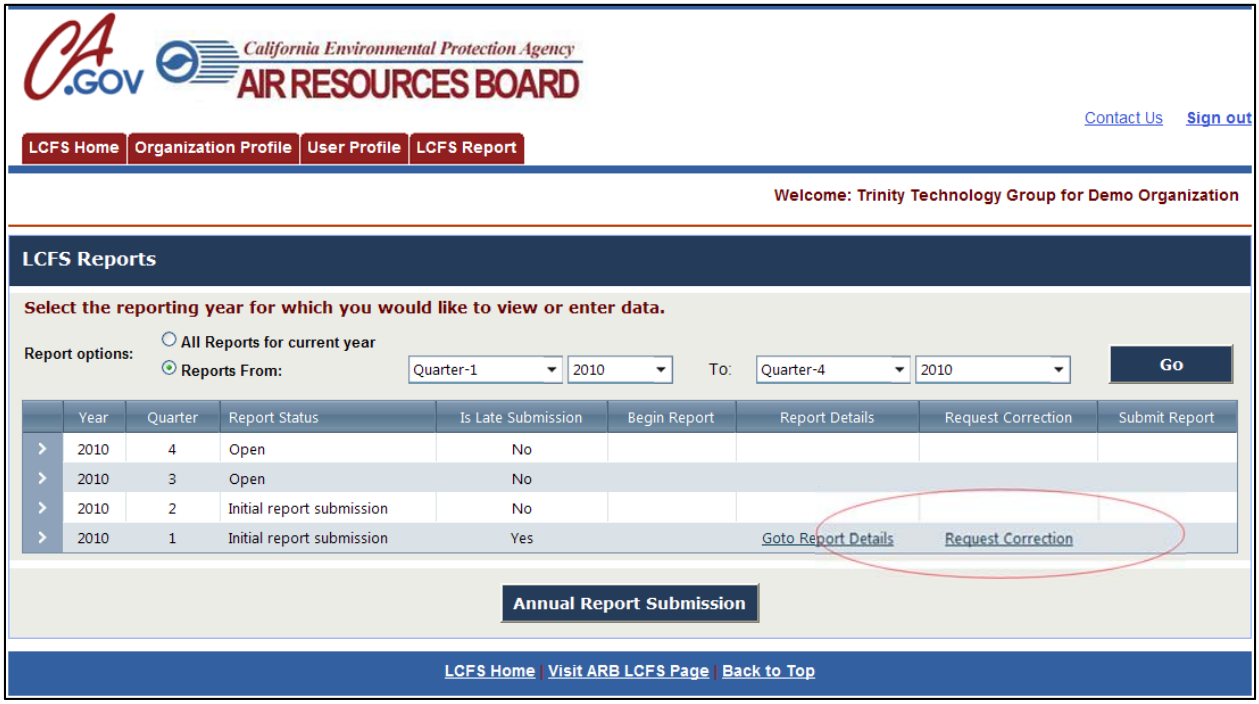
- ***6.2b The system shall allow staff to compose and send a response to the manufacturer explaining the reason for rejection (for returned materials) from either the Review page or a subsequent page***

When staff are reviewing submittals, they will need the ability to track both the approval, as well as the return and resubmission. Approvals can be as simple a single button implemented on an approval page, or it can be presented in a hierarchical workflow. The following example from a past implementation shows one approach to hierarchical approval, which allows multiple staff to approve/deny the submittal, and add comments along the way.

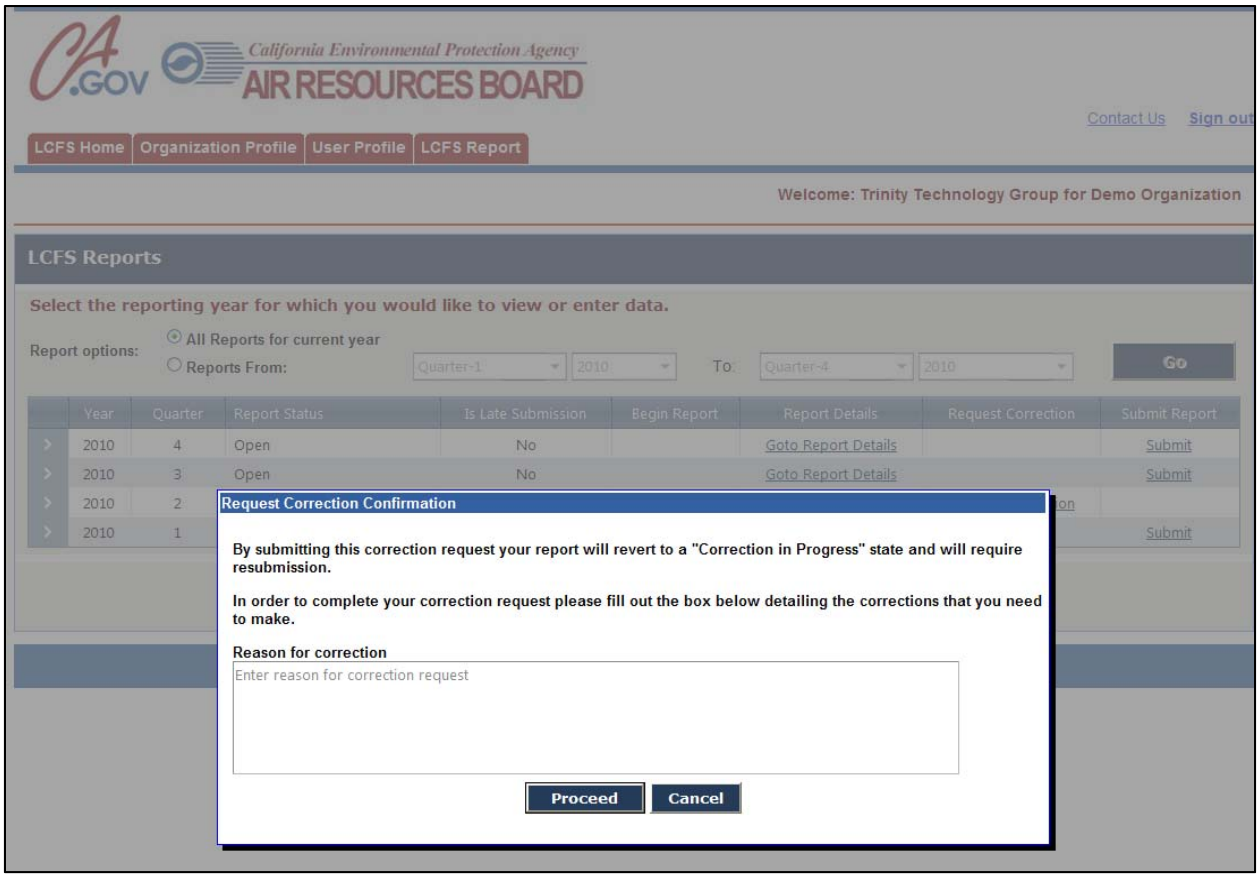


Those comments can be included in the content of an automated email template that is sent out if any of the reviewers ultimately deny the submittal. The MAEDBS system would be integrated with MS Exchange in order to create an email router that would support automated emails from an “admin” email address.

Another approach to communicating review feedback to users is to have the review comments be input on a separate page. In the following example from a different system, the approach was to specifically enact a “correction” process that would put the record in a “correction pending” state:



As shown above, there would be a link on the record to specifically request a correction. Once selected, staff, would be presented with a dialog box that allows staff to describe the nature of the correction. This would either be presented to the user on their application screen, or it could also be sent via email.



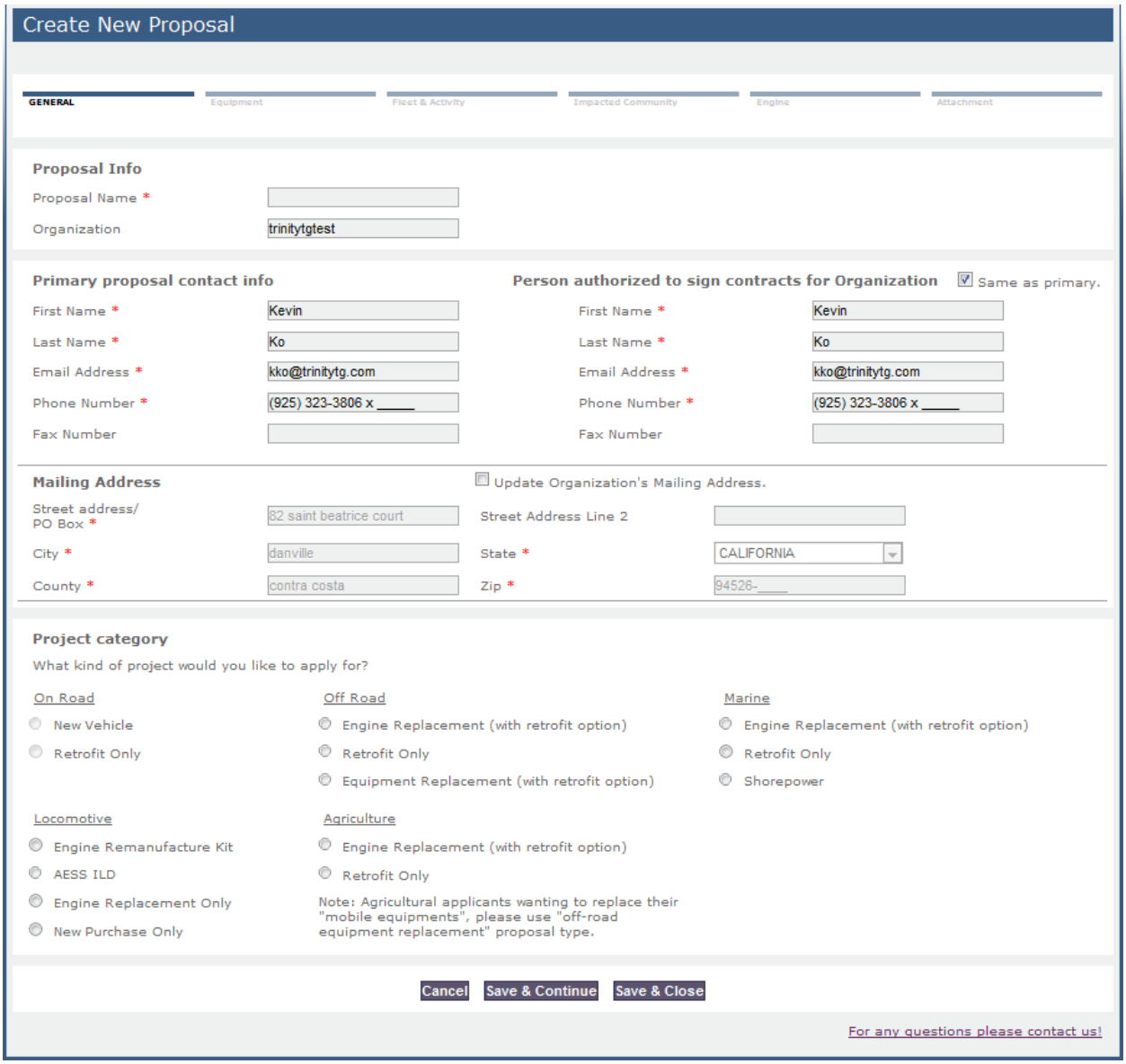
8.4 The system shall allow customers, on log-in, to accomplish the following tasks through interactive web pages

- *8.4b Securely submit new appliance listings and/or updates to listings*
  - *Customers shall be able to enter appliance data directly into an appropriate web interface or choose to upload data from a pre-formatted spreadsheet file*
  - *Customers shall also complete an electronic Declaration as a part of submitting or updating appliance listings*

The web portal will be deployed on a web server protected by 128 bit Secure Socket Layer (SSL) encryption (e.g. “https:”). This will allow for secure submission of all data.

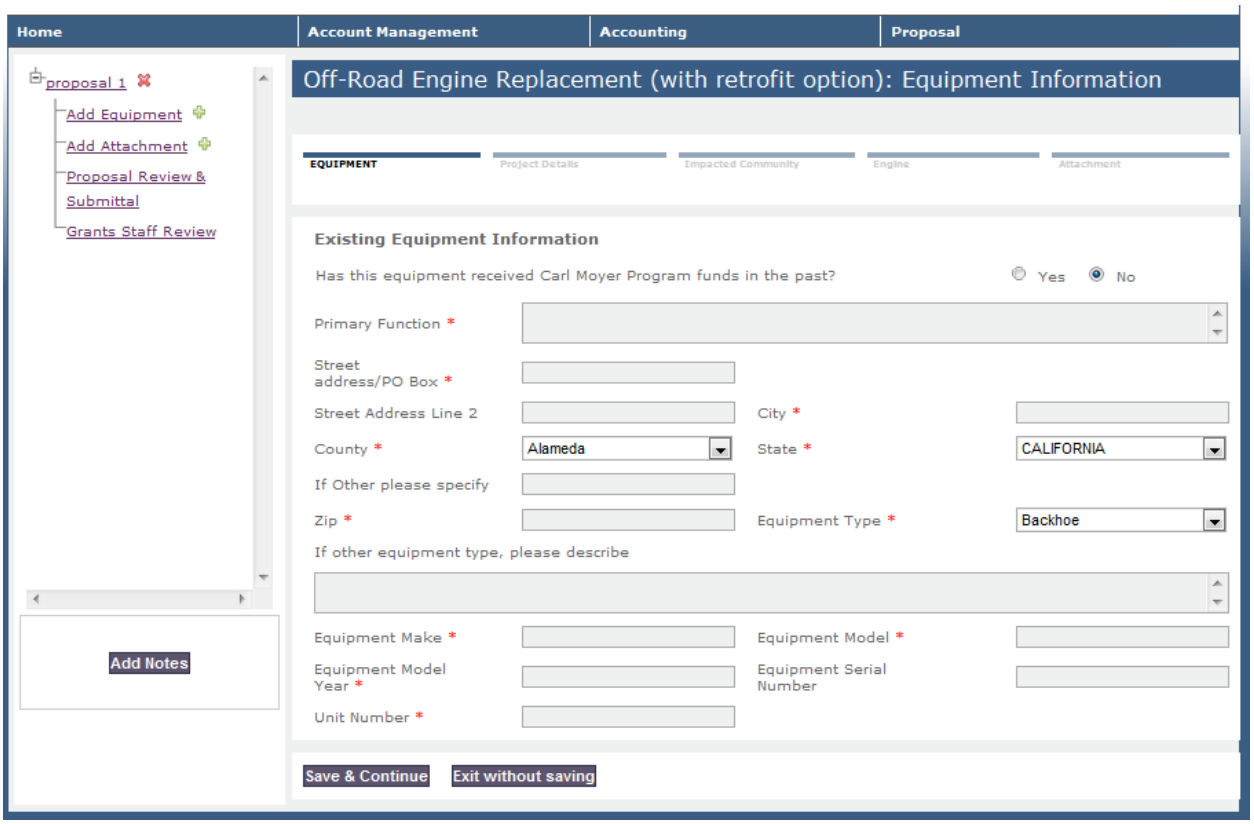
As noted in Section 3, our UI design approach includes the ability to enter in data directly in a series of pages that feature “wizard-based” guidance, as well as a bulk upload feature that supports a common spreadsheet format similar to what CEC publishes today.

For manufacturers and third party representatives, we expect to have a landing page similar to the sample below, where users first enter common information as well as select the specific application type.



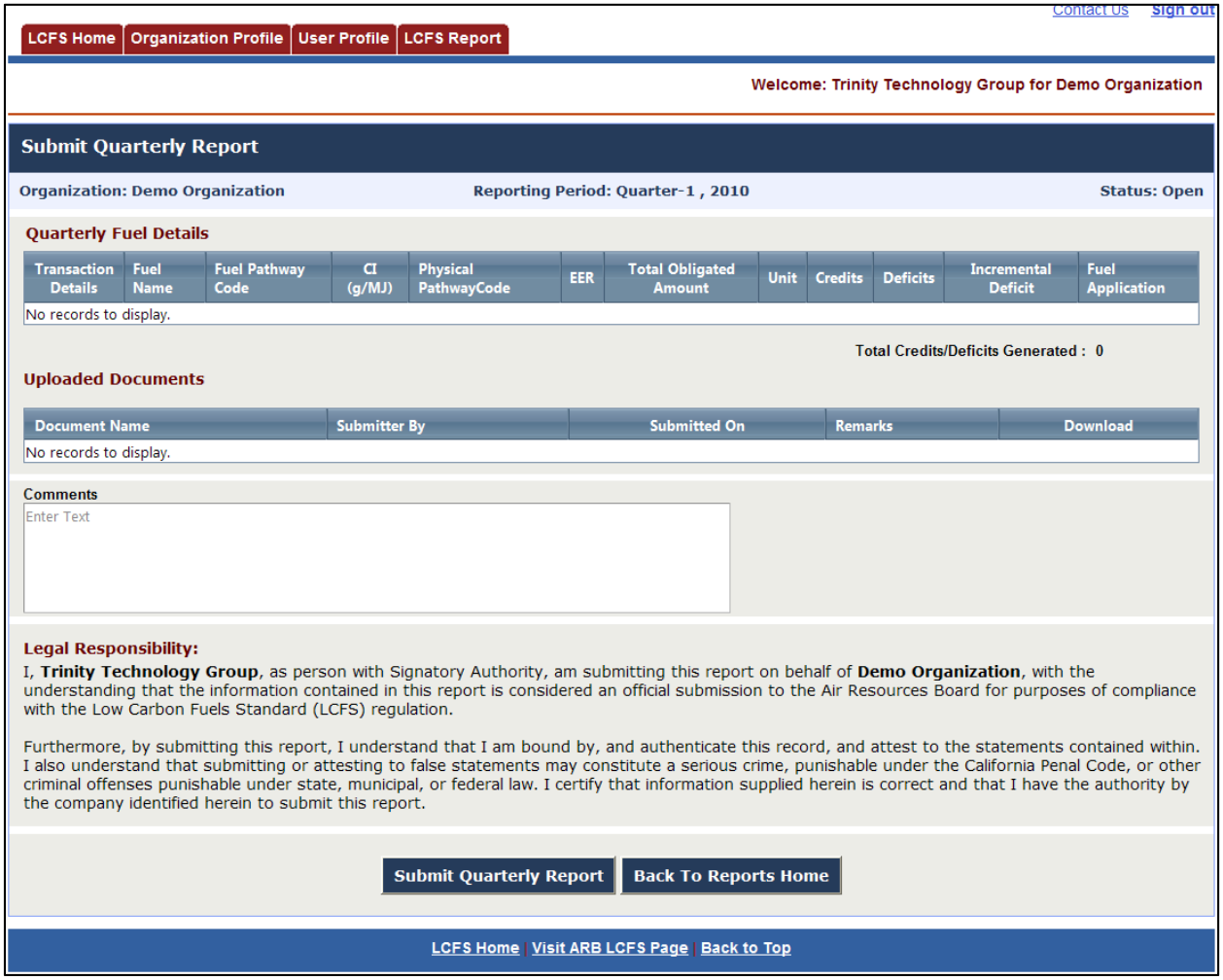
In this example, each application category type has been presented as a radio button. For appliances, we envision a similar display for appliances categories, with additional drop-down menus for individual appliance types within a given category.

From there, users would be presented with a screen that includes breadcrumbs, navigation aids, and buttons for saving progress incrementally as they enter information on each page:



For users that choose bulk upload, they are presented with a simple page for uploading the spreadsheet file. From there, the MAEDBS will run data validation rules on the submitted dataset and provide exceptions back to the user, allowing them to correct the submission either in the file, or fix the data through the web interface directly.

At the end of the application process is a submittal page, which includes the necessary legal declarations as well as a provision for digital signature. The page can be a standalone submittal page, or it can be combined with actual functionality such as document upload or additional comment submittal, as shown in the screenshot from a sample system below:



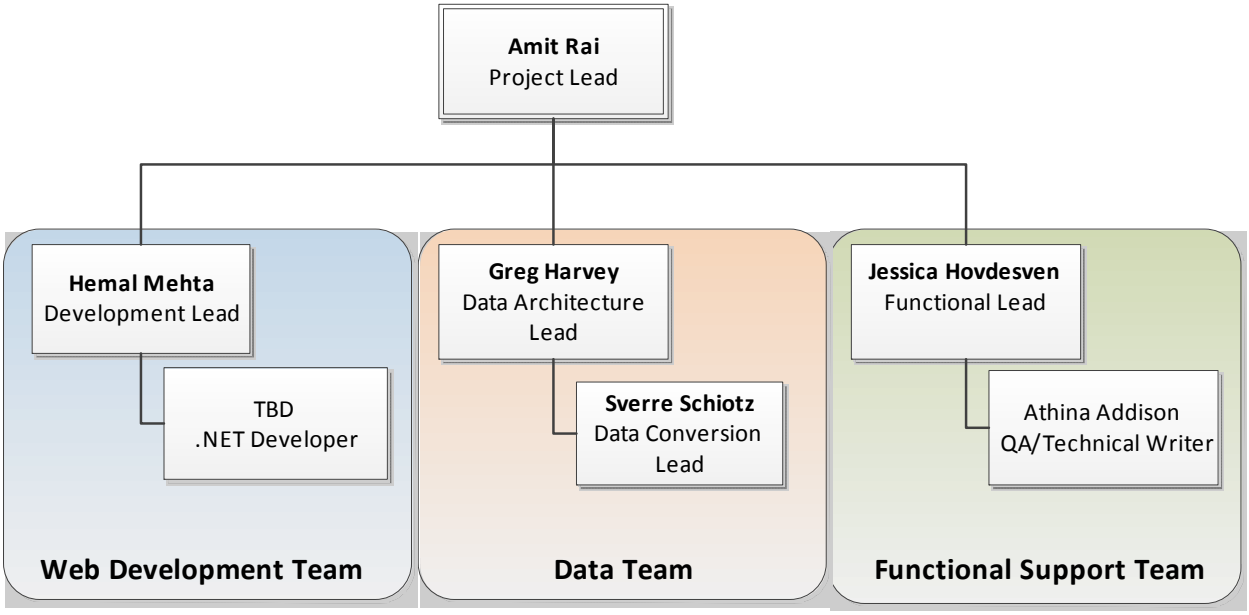
11.2 The page used to display an individual appliance listing shall automatically generate a QR code that encodes the unique http:// address for that listing. This QR code shall allow for a mobile device to scan a printout of the code and be immediately taken to the relevant appliance listing via the encoded link.

The TrinityTG/C&G Team will support incorporation of QR code generation by providing integration services for a non-open source QR code generator service. Using one of several existing cloud-based QR code generator services, we will generate a series of static QR codes that will represent the appliance listing. These are saved as images and will be incorporated into various webpages or printed materials as appropriate. However, it is important to note several assumptions about the scope of this functionality:

- We are assuming that the URLs for the appliance listing will be static, and thus the QR code does not need to be dynamically updated
- There are several QR code generator services that do not require ongoing subscription costs, so long as the QR code being generated is static. (Kaywa QR Code is one such example)
- If the requirement for QR code generation needs to include dynamic updates, then a subscription cost to a QR code generation service would be required, which is beyond the scope of this offer.

9. Organization Chart and Staffing

The following diagram depicts the proposed team composition:



The TrinityTG/C&G team is led by Amit Rai, the proposed Project Lead. He will oversee three threads of activity throughout the project.

Web Development Team – this is the team primarily responsible for developing the system. The team is led by Hemal Mehta, who has been identified as one of the key staff. This team will handle development of the service layer and presentation layer. There will be at least one additional support developer added to the project during the build effort.

Data Team – this is the team who will be responsible for designing the data architecture of the new MAEDBS, supporting the design of the new database, and leading the data conversion effort. This team is led by Greg Harvey, a senior DBA with extensive experience in enterprise data architecture. He will work closely with Sverre Schiotz, who brings an enormous amount of understanding and knowledge about the composition of the legacy systems, and the data architecture of the Appliance Efficiency Program. As a result of his extensive experience, Sverre is an ideal candidate to lead the data conversion effort.

Functional Support Team – in addition to the technical team staff who meet the staffing requirements in the RFO, we are also proposing the addition of business analysts to the team. These BAs will be responsible for the functional deliverables, such as use cases, testing, training, and implementation support. We have found that adding business analysts to a system implementation creates tremendous value for the project in that they provide a functional perspective that technical staff don't always perceive. Jessica Hovdesven and Athina Addison each have experience working on medium to large scale web development projects. Their experience in all phases of the software development lifecycle will bolster the quality of the product delivered by the TrinityTG/C&G Team.

Project Team Qualifications Matrix

Req. #	Skill	Amit Rai	Sverre Schiotz	Hemal Mehta	Gregory Harvey	Team Totals
Developers:						
12.1	Experience as a Senior Level Programmer in a large (1,000,000+ records) enterprise data system • Minimum 3 years	7 years	10 years	1.5 years	30 years	48.5 years
12.2	Skilled in Javascript and JQuery	5 years	1 year	4 years	-	10 years
12.3	Skilled in CSS3	6 years	1 year	3 years	-	10 years
12.4	Skilled in Cross-Browser Development	6 years	3 years	2 years	-	11 years
12.5	Skilled in import of records from spreadsheet to database	8 years	15 years	1 year	30 years	54 years
12.6	Experience in ASP .NET Webforms • Minimum 5+ years	7 years	10 years	5 years	-	22 years
12.7	Experience in SQL Server databases • Minimum 5+ years	7 years	15 years	5 years	20 years	47 years
12.8	Experience in User Interface Design / designing interfaces for usability • Minimum 2+ years	9 years	15 years	1 year	-	25 years
12.9	Strong background with development in Microsoft SQL Server 2008 R2 • Minimum 2+ years	7 years	3 years	2 years	5 years	17 years
12.10	Strong background with report development using SQL Server 2008 R2 Reporting Services (SSRS) • Minimum 2+ years	3 years	3 years	-	5 years	11 years
12.11	Strong background with using SQL Server 2008 R2 Integration Services (SSIS) • Minimum 2+ years	2 years	3 years	-	5 years	10 years
12.12	strong background with ASP.NET 4.0 using Visual Studio 2010 • Minimum 2+ years	3 years	3 years	2 years	-	8 years
Project Lead: (same as above except the following changes)						
12.13	Project Management experience in at least two projects of similar size and scope (or larger) • Minimum 3 years • PMP Project Management certification: include certification number in resume materials	5 years	[redacted]			5 years
12.14	Experience as a Senior Level Programmer in a lead capacity for a large (1,000,000+ records) enterprise data system • Minimum 5 years	7 years	[redacted]			7 years

AMIT RAI

SUMMARY

- 7 years of experience in IT industry and familiarity with all phases of Software Development Life Cycle (SDLC).
- Strong management skills as demonstrated by leading and mentoring individuals and teams.
- Excellent communication skills with strong background working directly with functional team, testing team and clientele to identify business objectives and establish requirements.
- Strong experience in diverse facets of .NET development, encompassing analysis, design, development, and execution of business applications.
- Experience in conducting design sessions with functional team and recommending solutions to complicated business problems.
- Strong knowledge of Object Oriented Analysis/Design. Expertise in design patterns.
- Proficient in design and development of N-tier applications.
- Skilled at creating well documented technical designs from functional requirements.
- Excellent domain knowledge of Voter Registration and Election Management system,
- Excellent domain knowledge of Child Support and Enforcement system.
- Seasoned software expert acknowledged for talents in precisely conceptualizing and directing the development and continuous refinement of advanced technology solutions to meet clients' needs.
- Sophisticated programming knowledge combined with problem solving strengths to meet challenges of business economics, client needs and technical innovation.

TECHNICAL EXPERTISE

Technical Skills	Expert	Intermediate	Novice
Languages	C#	VB.NET, Html, CSS	Java, JavaScript
Frameworks and SDKs	.Net Framework, ASP.NET, ASP.NET AJAX, NHibernate	NMock, WCF, NUnit, Microsoft Enterprise Library	Android SDK
Concepts	OOAD, Design Patterns and Principals, Refactoring	Unit Testing, SOA	
Modeling and Design tools	Enterprise Architect	Microsoft Visio	
Databases	SQL Server 2005, 2008		MySQL, Oracle, DB2
Version Control System	SVN, Visual SourceSafe		
Project Management tool	Atlassian Jira		Microsoft Project
Continuous Integration			CruiseControl.NET
Others		Microsoft Word, Excel	Microsoft SharePoint Server

EXPERIENCE

Trinity Technology Group May 2013 – Present

California Government Business Oversight (formerly Department of Corporations), DocQNet Implementation April 2013-Present
DOCQNET is a customized licensing, enforcement, and case management system that replaced over 50 legacy applications at the Department of Business Oversight. Built using Microsoft Dynamics xRM, SharePoint, SQL Server, and the .NET Framework, DOCQNET supports 5 business divisions in the licensing, compliance, and tracking of financial institutions in the state. It makes use of OTech's Tenant Managed Services, providing DBO with a brand new enterprise platform for hosting a number of applications. DOCQNET supports nearly 300 internal users, and provides a web portal for self-services access to license filing, fee payments, report filing, and complaint submission to nearly 400,000 licensed entities.

.NET Practice Lead Global Touch Points June 2012 – May 2013

- Actively involved in creating project proposals.
- Leading the effort to create and standardize project management and software development processes.
- Leading the effort for creating common application frameworks, coding standards, build management procedures, release management process, source code repositories.
- Setup hiring process for .Net candidates. Conduct technical and behavioral interviews.

Mobile Site - DMV Appointment System Global Touch Points June 2012 – May 2013
Design Lead:

- Led the effort to design UI for the mobile site: https://www.dmv.ca.gov/foa/mobileWelcome.do?localName=en
- Conducted the presentation of the prototype for the client.
- Researched various options to implement the site.

Projects for City Of Anaheim, Hewlett Packard May 2010 – May 2012

EVOC (Enterprise Virtual Operation Center): EVOC is customized SharePoint site. EVOC integrates data from 18 different systems to provide situational awareness of what's going on in the City of Anaheim.

My Anaheim: This is an Android and IPhone application for city users. Major features are: event guide for the city, capability to submit service request, call 311 etc. For more information please follow link:
https://market.android.com/details?id=coa.MyAnaheim.AndroidApp&feature=search_result#?t=W251bGwsMSwyLDEsImNvYS5NeUFuYWhlaW0uQW5kcm9pZEFwcCJd

EVOC Mobile: This IPhone/IPAD application provides Anaheim officials latest information about police, fire and other emergency events occurring in the city.

Dashboard for Fire Department: ASP.net website which displays statistical information concerning of Fire Department. It hosts performance benchmarks for fire and medical service calls. It also monitors response, travel and turnout time information.
Team Lead:

- Conduct feasibility analysis for new change requests and projects.
- Lead development of requirements, design models, and all documentation through project lifecycle.

- Responsible for determining project scope, liaising between clients and staff.
- Direct the coordination of all implementation tasks involving third party.
- Introduced new release and change management procedures.
- Successfully delivered projects on schedule and met customer satisfaction targets.

Software Developer:

- Designed and developed common frameworks (Exception Handling, Logging) for mobile and web applications.
- Designed and developed service, business and data access layer for multiple mobile and web applications.
- Used MVP pattern to implement presentation logic.
- Developed mobile applications on Android and WebOS platforms.
- Setup SVN repository to manage Android and IPhone application code.
- Extensive use of ASP.Net Chart control to implement Fire Department Dashboard.
- Used Microsoft Bing maps API to plot historic and real time data. It helped clients to monitor major events occurring in city using one application.

South Carolina Child Support and Enforcement System, Hewlett Packard April 2007 - April 2010

The CFS Project for state of South Carolina is to implement systems for Child Support Enforcement, Family Court Case Management, and the State Disbursement Unit. It is a state-of-art full function Child Support System, promoting efficiency for the state and case worker as well as improving customer service and collection abilities.

Team Lead:

- Led a team of 10-12 software developers.
- Planned and defined scope, timelines and resources of the sprint cycles for the development team.
- Responsible for delivering technical design and development of Case Initiation and Case Management module.
- Hired, mentored, coached and supervised team members to take on greater responsibilities.
- Facilitated problem solving and collaboration. Initiate sub-groups or sub-teams as appropriate to resolve issues and perform tasks in parallel.
- Ensure use of development standards via code reviews. Enforce Test Driven Development (TDD).
- Analyzed General System Design (GSD) documents and initiated DSD development process.
- Conducted sessions with functional team to review functional document and analysis model.
- Presented and delivered design artifacts to client for approval.
- Managed Jira to track all software development phases.

Software Developer:

- Created detail design artifacts consisting of detail system design document (DSD), domain model, collaboration and activity diagrams based on analysis domain model using Enterprise Architect (EA).
- Designed and developed presentation layer using Model View Presenter (MVP) design pattern, HTML, Cascading Style Sheets (CSS), JavaScript, and ASP.NET 3.0, Ajax, Master pages, CSS, web server controls and User Controls.
- Used WCF for interaction between presentation and service layers.
- Used Separated Interface pattern to implement data access layer. This layer also encapsulated use of Nhibernate.

- Developed queries, functions, stored procedures, and Triggers using SQL Server 2005.
- Used Tortoise SVN as client for version control system.
- Used ReSharper utility for refactoring and optimizing code.
- Extensively used NUnit and NMock to develop unit tests.

.NET Architect:

- Worked as member of Architect team to design and implement common frameworks (Notification, Exception Handling, Common Web and User Controls, User and Role Management module).
- Implemented notification pattern to collect information about errors and other details in the domain layer and communicate it to the presentation.
- Implemented Exception handling using Exception Handling Application Block.
- Implemented customized User and Role Management module.
- Actively participated in designing and implementing web solution based on MVP pattern.
- Actively participated in designing and development of different layers of N-tier application (Presentation, Service, Assembler, Domain, and Data Access). Also implemented Layer Supertype pattern to encapsulate common logic for each layer in base classes.
- Documented standards, guidelines, and tutorials for the developers.

Voter Registration and Election Management for New York State, Hewlett Packard Oct. 2006 – March 2007

A "bottom-up" centralized data exchange voter registration system that interfaces and communicates with the existing Election Management Systems in New York's 64 counties. This solution involved 11 million voter registration records along with five years of associated voter history. The system provided compliance with HAVA and fulfilled the state's election plan.

Software Developer:

- Worked with a team of two to develop web based Voter Registration application using .NET framework.
- Designed and developed various functionalities in the application like voter search, voter merge, find duplicate voters, resolve duplicate voters etc.
- Participated in design and development of domain and database model. Used Microsoft Visio for designing the models.
- Designed and developed all the layers (Presentation, Service, and Business and Data Access layer) for the application.
- Added Exception handling using Exception Handling Application Block.

Voter Registration and Election Management for Mississippi, Hewlett Packard June 2005 – Sep. 2006

A highly customizable HAVA-compliant elections management and centralized voter registration system. It logs registered voters and allows poll books to be printed at voting sites, as well as interfaces with other agencies databases to maintain accurate records. In addition, the system modules include district and precinct management, ballot and label administration, election workers and polling place management.

Team Lead:

- Responsible for assigning issues to offshore team for development and also providing technical and functional specifications for the issues.
- Successfully led implementation of numerous change orders like jury selection process, voter move etc.

- Managed Jira to track development cycle of all the issues assigned to team members.
- Maintained four application versions for Development, QA, Production test and Production.
- Responsible for mentoring and coordination with offshore team and new members.

Software Developer:

- Developed PL/SQL Packages, procedures and functions in Oracle; Created views, database triggers for various functional requirements.
- Assisted other team members with assignments as needed to ensure all deadlines are met.
- Developed several thousand lines of code in VB.net.

Functional Analyst:

- Discussed and gathered business and functional requirements from Focus Group.
- Participated in design and development of Logical and Physical Database Model.
- Led walkthroughs and meetings with functional and development team to discuss related issues.
- Performed functional testing before release of application to testing team.
- Conducted numerous training sessions on Statewide Election Management and Voter Registration system for the end users.
- Responsible for thorough acceptance testing before any production release.

Associate Consultant

- Extensive experience in providing effective customer service for solving software/hardware problems.
- Led production support for the application working directly with the users.
- Developed an accelerated subject-matter-expertise in regards to the Voter Registration, Election Management and Jury selection process by actively working with clients/SMEs and having an insight into the system functionality.

EDUCATION

- **Project Management Certification** PMP: PMI ♦ Passed 01/2012
- **Master of Science, Computer Science:** CSU Sacramento ♦ Major GPA 3.485 ♦ Graduated 12/2005

Project Management Institute

THIS IS TO CERTIFY THAT

Amit Rai

HAS BEEN FORMALLY EVALUATED FOR DEMONSTRATED EXPERIENCE, KNOWLEDGE AND PERFORMANCE IN ACHIEVING AN ORGANIZATIONAL OBJECTIVE THROUGH DEFINING AND OVERSEEING PROJECTS AND RESOURCES AND IS HEREBY BESTOWED THE GLOBAL CREDENTIAL

Project Management Professional

IN TESTIMONY WHEREOF, WE HAVE SUBSCRIBED OUR SIGNATURES UNDER THE SEAL OF THE INSTITUTE

Deanna Landers • Chair, Board of Directors

Mark A. Langley • President and Chief Executive Officer

PMP® Number 1483482

PMP® Original Grant Date 24 January 2012

PMP® Expiration Date 23 January 2015

PMI Project Management Institute

TRINITY TECHNOLOGY GROUP

HEMAL MEHTA

SUMMARY

Mr. Mehta is a developer with nearly 7 years of hands-on experience developing .NET-based web applications for both the public and private sector. He has worked as an active participant in all phases of the Software Development Life Cycle.

EXPERIENCE

California Department of Health Care Services, Medicaid Behavioral Health Services Fraud Analytics, January 2014 – March 2014

Mr. Mehta is serving as a .NET Developer for the *Medicaid Behavioral Health Services Fraud Analytics* project for the California Department of Health Care Serveries (DHCS). The project implements the Pondera Fraud-Detection-as-a-Service solution which will aid investigators in identifying potential fraudulent activity through the use of data validation, predictive analytics, link analysis, and geospatial analysis. Mr. Mehta is responsible for the implementation of the system's user interface. He is developing this project using MVC Architecture in Visual Studio 2012.

CA Correctional Health Care Services, Interim Dental Tracking Database (IDTD) Conversion, July 2012 – December 2013

Design, develop, configure, test, deploy and support the new Dental Scheduling Tracking System (DSTS) using MS ASP.NET, WCF, and SQL Server technologies by converting the existing MS Access based IDTD application (IDTD is an older MS Access application used at thirty-three (33) state correctional institutions whose main purpose was to provide for health care staff the ability to schedule and track dental-care appointments for patient inmates). DSTS application is responsible for scheduling and tracking dental information of all 33 institutions prison inmates across in California. The system is developed using N-Tier robust architecture with extensive use of WCF services. The system supports scheduling, tracking inmate movements in near real time, bundling appointments, creating a dental treatment plan. The system also supports shared calendar functionality where schedulers can see inmate's appointments for other disciplines such as Medical or Mental Health. Mr. Mehta is the lead UI developer on this project.

Department of Health Care Services, Medicaid Managed Care Contract Management and Capitated Payment System, March 2012 – July 2012

The CAPMAN system supports the Medi-Cal Managed Care Capitation Payment process for the Department of Health Care Services. The system satisfies the federally mandated HIPAA-compliance regulation of providing payment remittance information electronically to the Managed Care Plans via the 820 EDI Transactions. Mr. Mehta was responsible for UI development and maintenance. Mr. Mehta also created customized reports with the beneficiaries and health care provider data.

California Department of Water Resources, Urban Water Project, January 2011 – February 2012

Urban water suppliers submit voluntary and required water supply information to DWR. To better aid agencies in this effort DWR is developing an online submittal tool. Data online submittal tool (DOST) has been developed to support submittal of UWMP (Urban Water Management Plan) and PWSS (Public Water Statistics Survey) data. It enables water agencies to submit five year plans and supporting documents

for water related data. Mr. Mehta has worked on the Urban Water Management Plan (UWMP) developing user interface Webpages/Web controls. Mr. Mehta performed the Enterprise Authentication hookup and the Workflow hookup in UI. Mr. Mehta also performed the Enterprise Authentication hookup in UI for the Public Water Statistical Survey (PWSS).

California Department of Water Resources CA Ground Water Elevation Monitoring – CASGEM Phases 2 and 3, January 2011 – December 2011
The California Statewide Groundwater Elevation Monitoring (CASGEM) System project implements an automated system for online notification and data submittal by Monitoring Entities. Prospective Monitoring Entities will notify DWR of their intent to perform groundwater monitoring functions for the CASGEM Program. Mr. Mehta participated in application design, architecture design and database modeling. He created the Webpages/ Web controls for the Ground Water Elevation project. Mr. Mehta created the workflow and other service layer codes. He designed and developed reports using Telerik Reporting Tool. Mr. Mehta also performed enterprise authentication and user migration.

Repo Remarketing, September 2010 – December 2010
Mr. Mehta has worked on an internal website, implementing National Automobile Dealers Association (NADA) web service to get repossessed car valuations. The NADA valuations were used to compare with Kelly Blue Book (KBB) valuations. Mr. Mehta was responsible for implementing web-services in the internal website. He has also worked on converting Classic ASP code to ASP .NET.

Capital Public Radio, March 2009 – September 2010
Mr. Mehta was a webmaster associate developing and managing the Capitol Public Radio website using ASP.NET, SQL Server 2005. He managed three websites and developed a website with accessibility options for Sacramento Public Radio. The website meets the National Public Radio (NPR) requirements. He was also responsible for standardizing the existing code used on the new website.

California State University Sacramento Information Resource & Technology Labs, December 2008 – May 2009
Mr. Mehta was a CSUS Computer Lab Assistant responsible for maintaining labs and helping students with computer related questions.

Gateway Technolabs Pvt Ltd, India January 2007 – June 2008
Mr. Mehta was a Software Engineer responsible for developing web-based applications using ASP and ASP.NET, HTML, and desktop applications using C#.NET. He also defined database and project flow.

Game Portal
Mr. Mehta developed a multilingual gaming portal with a team of 16 programmers. The games (simple flash games to Massively Multiplayer Online Role Playing Games (MMORPG)) developed by third-party vendors, will be hosted by the website. The frontend GUI was created in the ASP.NET and backend database in SQL 2005.

Audio/Video Podcast (www.intellipodcast.com)
Mr. Mehta developed a podcast with a free/paid membership option, with a team of 6 programmers. The product allowed users to upload/distribute their videos/audios with friends as well as make them available to public. The users were restricted to data transfer and upload space according to free vs. paid membership.

The podcast was developed in ASP.NET, SQL Server 2005, FMS Server, and 3rd party applications (Blog, Forum, Chat).

Online Shopping Mall (www.koophart.nl)
Mr. Mehta developed an online multi-shop shopping mall with online/offline payment options with a team of 4 programmers. The website is customizable for look and feel according to the shop owner's preferences. An Admin panel is given to each shop-owner to set their website according to their own ideas. The frontend GUI created in the ASP.NET and backend database in SQL Server 2005.

Platform of Experts in Planning Law
Mr. Mehta developed a website, with a team of 4 programmers, for the Dutch Institute for Construction Law. More than 15 countries were involved in planning the laws through the website. The website was developed in ASP, with SQL Server 2000 as the backend database.

TECHNICAL SKILLS

- **Programming Languages/Tools:** C#, VB, JAVA, C, C++
- **Web Technologies:** ASP.NET, XML, XSLT, jQuery, HTML 5, JavaScript, CSS, ASP, JSP
- **Databases:** MS SQL Server 2012/2008/2005/2000, MySQL, MS Access, Oracle 11g/10g
- **Operating Systems:** Windows 2000/XP/2003/Vista, DOS
- **Mobile Development:** HTML 5 Web applications on Android and iOS
- **Tools:** VS 2012/2010/2008/2005, Telerik UI Controls, Infragistics Web Controls, DevExpress UI Controls, Telerik ORM, Visual Basic 6.0, SalesForce CRM, Microsoft Reporting tools, Flash

EDUCATION

- Master of Science, Computer Science, California State University-Sacramento
- Bachelor of Engineering, Information Technology, Gujarat University, India

C&G Technology Services, Inc.

SVERRE SCHIOTZ

SUMMARY

- Accomplished Developer with 15+ years of Relational Database experience, including more than six years developing custom applications for the California Energy Commission and California Department of Agriculture.
- Understands all facets of a project life cycle. Master's Degree in Management Information Systems, and former Aeronautical Engineer with US Patent.
- Problem solver with extensive project management experience (thrives in a multi-project development environment). Proven track record of converting systems requirements into easy-to-use database applications.
- Analyzes client requirements, and ascertains needs beyond the requests. Rapidly assimilates new technologies and methodologies to implement customized, state-of-the-art solutions.
- Maintains a clear focus on overall company and project objectives (i.e., designed an application that reduced staff (from 4 to 1) required to produce monthly publications for the CA Department of Agriculture).
- Highly effective communicator. Ability to interface and build rapport with clients/ end-users, technical specialists, and management at any level.

EXPERIENCE

Trainsgains, Inc., Senior Technical Lead Sep 2013 – Present

Automated supplier, compliance, and regulatory document management for the food supply chain. As part of a developer team, I am solely responsible for the maintenance and development of a Windows Service that downloads emails from pop servers, extracts pdf, Excel and MS Docs attachments and processes and stores the content in a database and stores the documents in the file system. Stored data and stored files are retrievable via a web UI. Data extracted from Excel via datasets, Content Controls from MS Word and automated OCR technology for PDFs.

- Implement new features requested by sales department and formalized in concert with CIO. Using Visual Studio 2010, C# and SQL Server 2008.
- Also involved with specifying database schema changes for new features and corresponding UI features for the customer web UI.

Troy Group Senior Software Engineer Sep 2011-May 2013

Secure Check Printing Solutions.

- As part of a developer team, in the process of creating a Microsoft Azure Check Printing SaaS application using Microsoft Azure and Microsoft Tools, inc. MVC.
- Create Customized web application check printing installations. Using MapForce, C# and XtraReports create custom file and print job parsers, check templates and configurations for web application and printing service. Maintain Web Application using Iron Speed.
- Customer Support: Remote installation of Check Printing Installations and troubleshoot customer problems.
- Created a Check Book Printing solution for banks in Africa, using IronSpeed, XtraReports, SQL Server and customizations using C#.

California Energy Commission Database Web Application Developer Apr 2010-Present

High Performance Buildings and Standards Development Office. Analyzed and document an MS Access Application for use in Low Cost Housing Cost Analysis. Upgrade all cost calculations from Access queries to SQL Server 2005 Views and T-

SQL and CLR Stored Procedures. Convert the Access Interface to a public membership Web Application using VB.NET, and ASP.NET using AJAX and JavaScript. Develop Administrative Web Site for maintaining memberships and update Energy Cost and Tax Rate Tables, using VB.NET, and ASP.NET using AJAX and JavaScript.

Trident Marketing, Database Web Application Developer Jan 2010-June 2010

- Participated in developing a monthly recurring credit card chard system, using Web Services, MS SQL Server, VB.Net and ASP.NET and AJAX.
- Maintained and Developed improvements to e-mail marketing system using in house MS SQL Server, VB.Net, ASP.NET and Web Services connecting to Vendor E-mail systems.

California Energy Commission Database Web Application Developer Oct 2009-May 2010

Energy Efficiency Division:

- Add new features, update data validation routines, import historical data and provide other maintenance functions for the "Appliance Compliance Program" Application developed in previous contracts, into a Web Application using VB.NET, ASP.NET using AJAX and JavaScript to create Dynamic Web Experience.
- Performed database maintenance of the MS SQL Server 2005 database, using Microsoft Visio for table maintenance and updated data validation stored procedures in T-SQL and VB.NET CLR based on Appliance Energy Efficiency Regulation changes and additions approved by the Energy Commission.

RSVP Communications Database Web Application Developer Dec 2007-Mar 2008

- Modify an existing web based call center script from handling one single script to using multiple scripts based on the type of business being called.
- Modify and optimized database structures and T-SQL stored procedures to retrieve caller info and proper call script, look up information and save prospect answers.
- Used SQL Server 2000 for data store, Web Site developed using VB.NET 2004 and ASP.NET.

California Energy Commission Database Web Application Developer Dec 2005-Jan 2008

Energy Efficiency Division:

- Re-engineer "Appliance Compliance Program" Application developed in previous contracts, into a Web Application using SQL2005, VB.NET and ASP.NET using AJAX technology.
- Analyzed existing application and staff work routines to design an improved user experience. Designed an application that requires less than 25% time and effort to add new appliances.
- Upgraded the database from SQL Server 2000 to 2005 using Microsoft Visio for Database modeling. Upgraded database access and data validation using T-SQL and VB.NET CLR stored procedures.
- Developed two different ad-hoc reporting systems one for application users without SQL knowledge. This system collects information from the user and writes the required T-SQL statement on the fly. The other system provides the database structure to the user who can then write their own SQL statements. The system checks the statement for proper syntax and then executes.

California Energy Commission Database Web Application Developer March 2004-December 2005

Energy Efficiency Division:

- Designed in cooperation with Commission Staff an intranet online searchable application for the "Appliance Compliance Program". Developed a Website for searching and downloading of the "Appliance Compliance Program" Database.
- Uploaded and converted Historical Data stored in several hundred Excel Spreadsheets to "Appliance Compliance Program" Database and modified the VB6 Application to display and report on the newly imported data.
- Created multi-User networked version of "Appliance Compliance Program" developed in previous contracts, using VB6 and SQL Server 2000

California Energy Commission Database Web Application Developer 1995-2004 Database Application Developer

Energy Efficiency Division, 1997 – 2004:

- Designed, developed, and implemented a database application for the "Appliance Compliance Program" to validate and maintain data submitted by appliance manufacturers (VB 6 and SQL Server 2000). Allowed Energy Commission staff to search, view, and edit individual and multiple models, and produce pre-programmed and ad-hoc reports in Excel and MS Access. . Used Microsoft Visio for Database Modeling.

Financial Services Office, 2001 – 2002 & 1999 – 2000:

- Created and implemented a relational-database application for the "Solar Energy and Distributed Generation Grant Program" using VB6 and MS Access to track applications and payments to the new grant program.
- Troubleshot and completed programming of a database application for the "Emerging Renewable Buydown Program" using MS Access to track applications and payments (tracked applications for rebates, rebate payments, and created customized reports).

Technology Evaluation Office, 1998 – 2000:

- Designed an application for the "Renewable Resources Trust Fund" to calculate and track purchases / sales of renewable-energy sources by Power Retailers (programmed using VB5 and MS Access).

CA Energy Commission – Energy Supply and Demand Forecast, 1995 – 1996:

- Developed application to collect and report forecast energy supply and demand data in MS Access (designed based on required data for the reports).

California Department of Agriculture Database Application Developer (Dairy Marketing Branch) 1996-2002

- Analyzed and redesigned an existing spreadsheet application used to calculate milk production prices from all California dairies (used Visual Basic 6, and a normalized relational database in SQL Server 7).
- Re-programmed and provided ongoing maintenance to the existing Statistics Database. Implemented an MS Access application to capture, maintain, and report Dairy Production and Sales data for the California Dairy Industry. Used ERWin Data Modeler for Database Development.
- Programmed an application to manage and print all mailing label lists (up to 30 reports and newsletters monthly, with custom recipients for each publication). Allowed staff to enter and edit a single addressee, and assign to multiple lists.

MCI State Government and University Markets Database Application Developer 1996 – 1997

- Analyzed and redesigned the existing manual system to capture internal work request from a nation-wide sales force.
- Developed an application in MS Access to record and assign work requests, and monitor and report work progress to managers and sales force.

Harbourton Mortgage Co. Database Application Developer (Information Systems Department) 1996

- Designed and implemented application in MS Access for IS Services Requests.

California Department of Corrections Database Application Developer 1996

- Analyzed a dBase/Clipper application, and designed and developed a new MS Access database to manage appointments and records for Parolees receiving Mental Health Services.

ReForm Automation, Database Application Developer 1994 – 1995

- Programmed Vehicle Maintenance System and Personnel Department Forms Application using FormFlow (also created numerous electronic forms).

Adams Group Management Information Coordinator 1991 – 1994

- Designed and managed development of a truck and trailer workshop-operation system using electronic forms in FormFlow (application automatically tracked work orders, inventory. and personnel time cards).
- Created a truck driver application-tracking system in FoxPro 2.6 to monitor all aspects of the job application and training process to abide by state and federal rules for application and training documentation.
- Designed and co-programmed a payroll application in FoxPro 2.0.

Self Employed Engineer 1985-1991

- Designed aerodynamic algorithms and control laws, performed comparative power generating analysis, and developed analytical applications.
- US Patent # 4,832,569 for a "Governed Vane Wind Turbine".

SKILLS

- **Databases: -** Microsoft SQL Server 2008/2005/2000/7/6.5; Access 2010/ 2007/2003/2000/9x/2.0/1.1
- **Platforms:** Windows Server 2008/2003/2000/NT 4.0, 3.5; Windows 7/XP/ ME/9x/3.x
- **Languages: -** C#, Java; Visual Basic .NET, Visual Basic 6.0, Visual Basic 5.0
- **Tools:** Microsoft Azure, MVC; TSQL and CLR Stored Procedures, LINQ, SSRS, SSIS; Altova Mapforce Data Mapping Tool; DevExpress XtraReport Report Writer; IronSpeed Application Code Generator; Windows Forms, WPF; OOP, ADO.NET, ADO, ODBC, WCF; Web Services , XML, SOAP, JSON; ASP.NET, ASP, AJAX, CSS, JavaScript; Visual Studio Team System, Visual SourceSafe; Visual Studio.NET ; Microsoft Visio; Internet Information Server; Object Oriented Programming;
- **Software:** Microsoft Office
- **Network:** Web-Based Application Interfacing with SQL Databases

EDUCATION

- University of California, Davis (Graduate School of Administration), Master's Degree – Management Information Systems
- Salford University, Salford, England, B.Sc. Degree – Aeronautical Engineering Science

GREGORY HARVEY

SUMMARY

Mr. Harvey is a senior Database Engineer with 30 years of experience. He has worked with a variety of database including Sybase and MS SQL Server (all versions since 1994). He is an expert in performance and tuning. He is a Senior SQL developer mastering stored procedures, functions and optimizer technics for fast running queries. Recent projects include designing the complete data warehouse and recovery system for the California Highway Patrol CAD system. Mr. Harvey has worked with large banks designing merger database code for migration and optimized HMS Health database for optimum speed with over 300 million rows of data to return in seconds.

EXPERIENCE

CA Department of Health Care Services, Senior Database Engineer Jan 2014 – March 2014
Mr. Harvey is serving as a Senior Database Engineer for the Medicaid Behavioral Health Services Fraud Analytic project for the California Department of Health Care Serveries (DHCS). The project implements the Pondera Fraud-Detection-as-a-Service solution (Medicaid module) which will aid investigators in identifying potential fraudulent activity through the use of data validation, predictive analytics, link analysis, and geospatial analysis. Responsibilities include creating stored procedures and tuning database performance.

Iowa Workforce Development, Senior Database Engineer Jan 2014 – March 2014
Mr. Harvey is serving as a Senior Database Engineer for the Unemployment Insurance Fraud Analytics project for Iowa Workforce Development. The project implements the Pondera Fraud-Detection-as-a-Service solution (Unemployment Insurance module) which will aid investigators in identifying potential fraudulent activity through the use of data validation, predictive analytics, link analysis, and geospatial analysis. Responsibilities include creating stored procedures and tuning database performance.

CA Department of Health Care Services, Senior Database Engineer Dec 2013 – Jan 2014
Performance and tuning for the Managed Care Capitated Payment and Contract Management system. SSRS coding and reports. Business Intelligence expert. Creating CUBES in SSAS. Expert creating ETL (SSIS) into Fact and Dimension tables for high end Data warehouse solutions. Designed ETL code from existing flat files and Excel spread sheets utilizing SSIS features.

CA Correctional Health Services, Senior Database Engineer July 2013 – Oct 2013
Designing and performance tuning the DSTS (Dental Scheduling Tracking System). Able to join an existing project after go live. Developed history feature to track inmates moving from bed to bed and other facilities with precise up to the minute data without affecting existing application code. Modified existing code to be sub-second using expert knowledge for performance and tuning.

First Corp Solution, Data Conversion Specialist April 2013 - June 2013
Convert data from various State and County offices from text files, XML etc. into MS SQL Server via bulk copy utility. Create new SSRS reports and update existing reports. Design a system for backups and creating a system for failover.

Maintaining existing batch jobs that help monitor system. Job requires update and in depth knowledge of Stored procedures, triggers, functions and MS Jobs.

LexisNexis, Database Administrator Dec 2012 - April 2013
This position exists to set architectural standard for Databases and related technologies by performing research, design, and development within the development, testing and production environments. Ensures continued availability and performance by creating, maintaining and administering of databases and related technologies while ensuring existing standards are adhered to and applied. This position provides direct input to project plans, schedules and methodology in the design and support of databases and related technologies. Installation, maintenance, security, performance monitoring and tuning, and administration of Sybase ASE, Oracle and MS SQL Server.

BlueShield of California, Database Administrator Oct 2012 - Nov 2012
Contract position developing plan to migrate all version of SQL Server to version 2012. This includes all proper licensing conversions and moving physical servers to virtual server environments. New projects include converting Access Database to SQL Server. Several meetings for other projects helping with design ideas and project planning.

Purple Communication, Database Administrator June 2011 - Sep 2012
Creating replication design for multiple SQL clustered environments. Preformed DBA duties backups, monitoring, and troubleshooting problems and performance tuning. Involved in daily team meetings in keeping a 24/7 application running. Developing new SQL procedures for new features. Technical environment: SQL Server 2008, SQL Server 2008 R2, SSIS, SSRS, Business Intelligence Development Studio. Performance tuning utilizing existing and developing new SQL code.

CA Highway Patrol, 911 Project Database Developer Mar 2011-March 2012
Develop replication model to combine 4 CHP hubs CAD systems into one central location. Designed horizontal partitioning table design to support very large California 911 system's data. Created reports as required by CHP for the new data model. Develop XML feed for CHP dashboard (seen every 15 seconds). Involved with weekly strategy meetings. Crossed trained CHP on code and reports created. Technical Environment: SQL Server 2008 R2, SQL Server Report Builder 3.0, SSRS

Vision Service Plan, Data Conversion Specialist Sep 2010 - March 2011
Convert data from third party software to OfficeMate software. Currently since my hire date, I have been building an ERD (entity relationship diagram) and developed code to merge the current OfficeMate local software to OfficeMate Enterprise. This involved learning the relationships between the tables and designing merge code to allow multiple offices to become one. Task completed without help from existing developers. VSP has been trying to accomplish this for over a year without success. Performance and tuning existing VB6 code for upgrades. Currently code was taking up to 18 hours to upgrade. The average upgrade code took 2 to 5 hours. After converting code to SQL stored procedures upgrades now take 5 minutes for average and no more than 1 hour for the largest client.

TechSoup Global Inc., Database Administrator June 2009 – Sep 2010
Performance and Tuning MS SQL 2000/2005/2008. Reviewing scripts and data modeling. All normal maintenance duties. Developing and automating current forecasting scripts for tables and database growth. Working with developers on SQL coding issues. Trouble shooting production, QA and development server problems.

Implementing replication and full text server features. Creating special stored procedures for existing Axapta, Onyx and Commerce Server applications. Creating and setting up monitoring tools for all environments. Developed reporting server for data warehousing. SSIS packages created for reporting server failover and staging server.

THX, Database Administrator April 2009 - June 2009
Performance and Tuning MS SQL 2005/2008, SSIS. Responsible for ensuring availability and performance of the databases that support the system. Work to ensure that the associated hardware resources allocated to the databases and to ensure high resilience and performance tuning. To proactively monitor the database systems to ensure secure services with minimum downtime. Responsible for providing trend analysis to management team to enable them to make informed decisions regarding resource management. Responsible for troubleshooting and problem solving of SQL development. Responsible for improvement & maintenance of the databases to include rollout and upgrades. SSIS development for DTL loads.

IMS Health, Senior DBA Jan 2009 - April 2009
Performance and Tuning on MS SQL 2000/2005. Several large databases utilizing partitioning and snap shot feature of 2005. Data design on current projects to improve performance on existing databases. Advising on techniques to increase speed for ad-hoc queries. Very large Horizontal Partitioning. Maintained projects and tasks via iTrack ticket tracking and knowledge base system. Participated in new project and meetings for new ideas for our very large databases. Backup and restore databases using Litespeed software.

POS Portal, Senior DBA August 2007 - December 2008
Performance and Tuning MS SQL 2000/2005. Reviewing scripts and data modeling. All normal maintenance duties. Creating and automating forecasting scripts for tables and database growth. Working with developers on SQL coding issues. Trouble shooting production, QA and development server problems. Implementing replication and full text server features. Upgrade MS SQL Server 2000 to 2005. Review features of SQL 2008 for future enhancements.

LexisNexis, Senior DBA April 2004 - July 2007
Performance and Tuning. Database design on Sybase ASE 12.5.3. Responsible for writing triggers and stored procedures. Trouble shooting existing stored procedures for optimization. All normal DBA functions. Creating documentation for existing applications. Creating department procedures. Manual data cleanup and insertion for application. Developing SQL for external & internal application interfaces. Replication Server specialist.

GSA/Sybase Professional Services, Sybase DBA October 2003 - March 2004
Performance and Tuning for all current GSA applications on Sybase ASE 12.5.1. Lead DBA for new GSA application being created. Responsible for migration from development to test/production environments. Working with UNIX and Network teams to resolve all issues like NetApps and Linux problems. Involvement with MS SQL DBA responsibilities. Responsible for daily backups and dbcc reviews. Creating new scripts to monitor database activities. Evaluate new products for the GSA. Replication server 12.5 design for new GSA application.

Hewlett-Packard, Sybase DBA Jan 2003 - Oct 2003
Level 3 DBA for world -wide support. Last level of Sybase technical support for three regions (Europe, Asia and America). Critical 24/7 application, which handles conversion of Compaq and Hewlett-Packard merger. This is a clarify application for the world to access support from Hewlett-Packard. Handled performance and design escalations. Replication server design and implementation. DBA for all development and testing environments. This includes documentation release notes for the regions, building servers and upgrades. Disaster recovery plans and database design. I am responsible for over 80 database servers. Creating cronjob scripts using the Kornshell scripting language. Knowledge of the clarify applications and its connection with Sybase ASE 12.5.1. Expert with replication server. Member of install team for rolling out new release to the regions. This includes brainstorming, documentation and implementation. Also included normal DBA functions like add users, create tables, dump/loads etc. Install Oracle 10g Server for development projects on UNIX. Technical Enviroment: Sybase ASE 12.5.1, Replication Server 12.5.

Sybase Inc., Professional Services Consultant May 2000 - Aug 2001
Help and resolve issues the average DBA could not resolve on All versions of Sybase ASE (system 10 through 12.0). Successful in rewriting stored procedures and restructuring indexes so applications could run at an optimum speed. A variety of engagements including performance and tuning, trouble shooting, DBA duties, installations and debugging. Programming in a team environment. Developed the data load and data model portion of the project. Worked in a team environment with daily status reports and ongoing changes. Vocal leader in the systems designs for our team's strategies. Designing the data model and restructuring of databases. Successful engagements with companies like: American Express, FOX Broadcasting, KMV, Arizona State University, U.C. Berkeley, Visa and others.

CAP Gemini (Sprint), Senior DBA Feb 2000 - May 2000
All normal DBA duties and functions. Work with developers in database design. Restructuring database layout. Creating disaster recovery policies and procedures. This position required creation of stored procedures and triggers. Monitoring the database's growth. Databases were migrated to history database every month. This was a 24/7 operation, meaning all tasks needed to be done with 99.9 percent up time. Used database recovery methods on several occasions saving large amounts of time and money in this position. Technical Environment: Sybase 10.x

Practice Works/ Info Cure, MIS Manager March 1999 - Feb 2000
Duties include but not limited to independently researching and resolving complex technical problems and mission critical support requests. Negotiated with vendors for IT products purchased. Administer phone system programming, Microsoft NT LAN system, and technical support's database (Access97/MS SQL 6.5), accounting, marketing and sales applications. Maintain Outlook clients for MS Exchange Server. Project planning and department budget control. Involved in the company's overall growth and planning decisions. Trained our technical support staff for proper call handling procedures, Taught Microsoft's NT, Win98 and Novell operating system's environments to staff. Planned and budgeted move away from our parent company, involving negotiations with vendors for T1 lines, phone system and new computer hardware. This was a transparent move, which caused no downtime for company. Migrated software for all departments from parent company to new site.

Sybase Inc., Senior Technical Support Engineer Feb 1996 - Dec 1998
Support Sybase Open Server / Open Client software. Knowledge of internals for technical support. Expert server specialist on PC platforms. Escalation consultant on all platforms for server internals. Platforms included DOS, Windows NT, OS2, Novell, SCO UNIX, sun4/solaris, AIX and HP9000. Resolved several hundred DBA problems from slow running stored procedures to down servers.

Rebuilt databases from patching techniques learned from the internals of SQL servers. Effectively used escalation and communication procedures as needed to involve management, other vendors, Sybase PSE, development, and Sales Reps/Sybase consultant's to provide awareness and resolution in a timely manner. Participated on product development teams, providing supportability perspectives. This included assistance with product beta testing, as well as the review of documentation and training materials. Provided on-site customer support in critical situations as required as well as developed a mentorship and training program for new employees and customers as required. This included problem definition, prioritization, analysis, recreation and resolution. Meticulously, consistently, and clearly documented customer software problems and general problem resolution information (knowledgebase). Attended internal product and outside training as required. Technical Environment: MS SQL 4.2/ 6.0 – Sybase 4.x / 10.x.

Hewlett-Packard, Response Center Engineer May 1994 - Feb 1996
Support Sybase Open Server / Open Client software. One of 10 handpicked engineers to create a startup team for Sybase outsource technical support group. Team leader in designing policies and procedures. Research software tools to simplify processes. Must maintain all knowledge of connectivity, hardware and any other issues in keeping software running. Technical Environment: MS SQL 4.2/ 6.0 – Sybase 4.x/10.x. Platforms include DOS, Windows NT, OS2, Novell and SCO UNIX.

TECHNICAL SKILLS

- SQL DBA / Professional Services
- Horizontal and Vertical Scaling (partitioned tables)
- Performance and tuning (all versions of Sybase ASE and MS SQL 2000/2005/2008 R2/2012)
- Data modeling, ETL (SSIS) and design of databases: OLAP SSAS Cube design, SSRS report designer
- Replication Server design and diagnostics (all versions of Rep Server)
- ECommerce development experience (Axapta, Onyx and Commerce Server-2000/2009)
- Diagnose, resolve technical hardware and software problems
- Management and forecasting
- Microsoft Server / HP UNIX 11.0 /Solaris 10x /Novell LAN operations and documents
- Routers (CSU/DSU), hubs & switches
- EDI –X12
- Portal experience
- Experience with all levels of SQL [connectivity, language & other related issues.]
- Ability to work independently with end-users to plan, develop and implement systems.
- UNIX Scripting

- **Hardware**: Aberdeen NAS Servers and storage. Dell EqualLogic NAS/SAN for iscsi. IBM SAN. Setup complete LAN systems (cables & software). Change disk drives, memory, upgrading motherboards, modems & other related technical parts of the microcomputer systems. LaserJet printers.
- **Software:** MS SQL 2000/2005/2008/2008 R2/2012, Sybase 12.5.3/15.0, Oracle 9g/10g, SolarWinds Network Performance Monitor, Enterprise Portal, Replication Server, KornShell, Windows NT, UNIX, DBArtisan, LiteSpeed, e-Biz Integrator (MQServices), ECMap (EDI) Informatica, Office 2007, Exchange Server, Veritas Backup Exec, Fox Pro for windows, MS-DOS, SQL relational database and several communications packages

EDUCATION

- 05/07 – 08/07 MCTS Certification
- 05/94 – 05/06 Sybase Training Center: (internal courses) all related courses to Tech support/ Professional Service.
- 04/06 - Replication Server 15.0
- 06/05 - I/Q Data Warehouse
- 06/01 – 05/01 ECMap (EDI X12) NEON/Sybase
- 05/01 – 05/01 E-Biz Integrator (MQSeries) NEON/Sybase
- 09/00 – 09/00 Informatica (PowerMart 4.7.1)
- 08/97 – 08/97 SA-285 Solaris 2.x System Administration
- 07/95 – 08/95 Microsoft WIN98: (Train the Trainer Course)
- 04/95 – 05/95 Microsoft NT: (Train the Trainer Course)
- 11/91 – 12/91 Select Training Centers: Novell CNE Course.
- 06/88 – 10/88 U.C. Berkeley Extension: Introduction to Accounting
- 09/85 – 11/85 Contra Costa College (San Pablo): dBase II Programming.
- 04/83 – 06/83 Heald Business College: Word Processing

JESSICA HOVDESVEN

SUMMARY

Business Consultant experienced in large scale custom software development, change management and implementation activities with an emphasis in Health and Human Services.

- Strong Analytical skills
- Extensive experience in Change Managements and Implementation
- Software testing, programming and technical help desk experience
- Strong project management, collaboration and problem solving/troubleshooting skills
- Ability to transform customer requirements into a workable design at functional/technical levels
- Facilitation experience for conducting user design and review sessions and running stakeholder agreement meetings

EXPERIENCE

Senior Business Analyst, Trinity Technology Group, DocQNet, Sacramento, 05/2013 – Present

Lead business process assessment meetings to drive application design. Create process flows, activity diagrams, use cases, detailed components, data model and security matrix for the Requirement Validation and Detail Design documents. Lead validation meetings to review and confirm design met the business need. Participate in Organizational Change Management meetings. Create DED, Training Plan and all training materials. Provide implementation support to ensure a smooth transition to the new system.

Senior Business Analyst, Deloitte, Indiana Eligibility Determination Services (IEDS), Indianapolis, 11/2012-5/2013

Define requirements for Patient Protection and Affordable Care Act (PPACA) implementation. Use the PPACA regulations to drive out functional system requirements. Develop functional design to meet business processes & functional system requirements. Validate design with stakeholders to ensure that the design satisfies the requirements. Complete Requirement Traceability Matrix (RTM), Business Process Model (BPM) & Preliminary/Detailed System Design documentation for Functional Requirements and Design.

Senior Business Analyst, Accenture, California Health Eligibility and Enrollment Retention System (CalHEERS), Sacramento, 05/2012 – 11/2012

Assist in defining and reviewing requirements and use cases for the application. Use the business process requirements to drive out application requirements and metrics. Design the application to meet the business process design and application requirements. Validate the design with the stakeholders to ensure that design satisfies the requirements. Supervise 4 designers/developers in completing functional designs. Inform the application architect, technical architect, and project manager of any issues that may affect other areas of the project. Participate in quality management reviews to ensure the application design and related work products satisfy the requirements. Participate in transitioning the designs to the developers, and ensure a clear and complete understanding of the designs. Ensure that other team members have

information they need to complete their work. Complete all appropriate documentation required by the developers, testers, deployment team, and application management team that will maintain the application

Senior Business Analyst, Accenture, Consortium IV (C-IV), Modesto, 01/2012 – 05/2012
Partner with clients to produce standardized streamlined processes resulting in increased customer service. Recommend innovative processes to increase employee loyalty and reduce turnover. Develop and maintain accurate documentation and diagrams to provide management with proper understanding of organizational processes. Evaluate alternatives and provide recommendations for technology/process solutions to meet business requirements. Develop and manage project plans while providing status updates to management. Manage time and expenses for a team of 3 which resulted in finishing deliverables ahead of schedule and under budget

Senior Business Analyst, Accenture, Consortium IV (C-IV), Riverside, 07/2011 – 12/2011
Provide onsite support to implement company policies, technical procedures and standards. Manage 3 internal & external resources including vendors, contractors and client staff. Strengthen business by leading a successful implementation of standard business processes. Train, coach and mentor staff to ensure smooth transition to new processes. This includes implementing the appropriate organization changes, developing and delivering training and communications, and ensuring that all support procedures are documented. Serve as a liaison between the development and the operation groups, ensuring that operation group needs and expectations are met by the development project. Ensure that all requirements, service introduction plans, and commitment changes are communicated to all affected team members. Obtain buy-in from stakeholders for all key service plans and commitments

Business Analyst, Accenture, Consortium IV (C-IV), Riverside, 03/2011 – 07/2011
Develop and updated the Change Plan/Change Discussion Guides including As-Is assessments and To-Be models, including facilitation of decision making & change readiness measurements. Establish working relationships with key management, staff and stakeholders. Develop ongoing communications and involvement plans for assigned client sites. Assist client in formulating communications to project staff. Manage gap analysis and deliverable creation for assigned offices. Identify a list of key stakeholders and stakeholder groups, and define their goals and expectations, levels of commitment, and ability to influence the change process. Develop change acceptance strategy to ensure the intended change implements successfully.

Business Developer/Proposal Writer, Accenture, Sacramento, 08/2010 – 03/2011
Assist in the writing of a proposal that would provide a client, which has multiple systems and paper-based processes and lacks a centralized solution, a system to support planning, determination, financial management, and interfaces necessary to support business processes and procedures effectively. Responsible for describing how our solution will address the functional requirements for the proposed system. Complete work assignments on time regarding team deadlines, worked collaboratively with functional team and

other teams (e.g. technical, conversion) to develop a solution that provides an integrated solution. Work independently to refine the assigned functional areas leveraging past experience and relationship. Research previous proposals for effective sales writing, and assisted other team members as capacity allows. Review additional functional areas and providing insight.

Business Analyst, Accenture, Consortium IV (C-IV), Sacramento, 02/2009 – 08/2010
Facilitate business process reviews in order to document and develop change recommendations. Develop change management work products and deliverables, and conduct change management training and readiness assessments. Work with Client Change Management Lead to plan Process & Role Gap Analysis Meetings. Facilitate a Weekly Planning Call to discuss action items, Decision Points, upcoming meetings, issues, and project communications. Facilitate the Process and Role Gap Analysis Meetings to discuss current processes, review standard To-Be Business Processes, and discuss client-specific To-Be Business Processes.

Business Analyst, Accenture, Consortium IV (C-IV), Sacramento, CA 11/2007 – 02/2009
Perform detailed design of application and technical architecture components and classes. Develop scripts to create/load common test data. Configure, built, and test the application components and classes. Work with other developers, designers, and architects to make sure that the configuration and custom components meet application requirements and performance goals. Follow good security coding practices to ensure the application is free of most common coding vulnerabilities. Check code coverage of unit and assembly tests and ensured it meets expectations. Document the code during development to ensure maintainability. Inform the technical architect and project manager of any issues that may affect any other areas of the project. Participate in transitions of the application architecture components to the testers. Fix any defects and performance problems discovered during testing. Document the application to facilitate maintenance.

Testing Analyst, Accenture, Consortium IV (C-IV), Sacramento, CA 03/2007 – 11/2007
Develop test scripts, test conditions, input test data, and expected results for application product, integration product, performance, and operational acceptance. Develop, update, and maintain testing standards and procedures. Record problems and issues in accordance with the project's problem and issue management plans. Document defects using the project’s defect management tools. Work with the application team to resolve any issues that arise out of the testing process. Participate in the release control process to ensure that solutions meet business requirements. Inform the test lead of any issues that may affect the schedule, budget, or quality of the product or the testing process.

EDUCATION & TRAINING

- California Polytechnic State University – San Luis Obispo, CA 12/2006, Bachelor of Science: Electrical Engineering -Communications
- California Polytechnic State University – San Luis Obispo, CA 12/2006, Masters of Science: General Engineering -Integrated Technology Management

ATHINA ADDISON

SUMMARY

Practiced Business Analyst and Project Management on a variety of major projects and system implementations. Possesses strong analytical, organizational, and problem-solving skills required to achieve project goals and objectives. Expert knowledge of and ability to perform analyses such as: GAP analysis, business process mapping, root-cause analysis, risk analysis and requirements gathering, as well as the ability to identify, analyze, and resolve complex cross-functional problems related to business operations. Has strong leadership and project management skills including excellent interpersonal, verbal and written communication skills, which are utilized to achieve organizational results with people in a manner which establishes a positive rapport and professional working relationship.

EXPERIENCE

Trinity Technology Group, Feb 2014 – Present

California Department of Health Care Services –CapMAN Feb 2014 – Present
OHC834 system was developed for the Department of Health Care Services, to process the beneficiary records enrolled in Medi-Cal and transmit information to all corresponding plans in which they are enrolled. As part of the requirement, Office of HIPAA Compliance division was to ensure that the system converts the enrollment information into HIPAA compliant X12 EDI files before transmitting them to vendors. The OHC834 system receives beneficiary enrollment changes from MEDS mainframe database on a day to day basis, maps the information into 834 format 5010 version, and transfers files to Secure FTP site for vendor pickup.

UC Davis Health System, February 2012 – December 2013

Analyst V, Billing System Support

- Acted as a liaison between the business and IT.
- Gathered and prioritized end-user requirements.
- Coordinated analysis of department documentation and work flows.
- Created application technical configuration specifications.
- Analyzed, designed, developed, tested, and implemented application functionality to meet strategic needs of the organization and departments based on the project's overall guiding principles.
- Troubleshot end user and system issues.
- Participated in application training programs, including re-training and updated certification as updates and modifications occur.
- Developed and monitored measurements of process improvements, including those enabled by standardized workflows.
- Procured (RFI/RFP), contracted, implemented and maintained vendors and associated systems for processes and work flows which are outsourced (this includes vendors for hospital and professional claims processing/submission for commercial and Medicare payors, hospital and professional contract management, professional charge scrubbing, address verification, charity care eligibility, credit card payment processing, and insurance eligibility verification).

Blue Shield of California, July 2004 – Feb 2012

Lead Operations Specialist, Specialty Benefits Operations (March 2009 – Jan 2012)

- Managed the performance of the Specialty Benefits vision vendor including creation of and monitoring of vendor dashboard;
- Managed employee workload and performance including creation of goals and objectives as well as creation and management of performance measurements;
- Identified and planned opportunities for improvement in operational performance;
- Provided analytical support to improve business process operations and business requirements management through the analysis and interpretation of data;
- Worked cross-functionally in analyzing, designing and developing business solutions;
- Provided analytical support for multiple, highly complex, projects while simultaneously supporting the development of project work plans and timelines;
- Defined highly complex business requirements and provided analysis toward operational efficiency and drove change within the organization;
- Analyzed actual results against plan and forecast and provided analysis and recommended interventions where appropriate;
- Developed, prepared, and analyzed complex reports for management review;
- Facilitated presentations to various levels of management as well as to a variety of vendors.

Senior HMO Benefits Expert, DoFR Configuration (Oct 2008 – March 2009)

Senior Operations Specialist, Benefit Analytics (June 2006 – Oct 2008)

Senior Claims Processor, Hospital Exception&Transplant Unit (April 2005–June 2006)

Senior Customer Service Representative, CalPERS Customer Service (Nov 2004 – April 2005)

ACCOMPLISHMENTS

- Successfully lead the requirements gathering, business validation testing, and user acceptance testing for the design and implementation of a new business and technology program. Further designed the operational workflows associated with the new business and technology program.
- Successfully lead vendor disengagements (which resulted in dramatic cost savings) while transitioning the outsourced work back in-house.
- Successfully lead multiple vendor procurements and implementations.
- Successfully lead multiple system fixes and enhancements for a variety of systems with each resulting in operational process improvements, process automation, and/or overall process cost reduction. Each initiative included requirements gathering, documenting requirements, requirements modeling, close partnership with IT, testing, production pushes and updating process documentation.
- Created, implemented, and maintained complete operational process documentation.
- Created, implemented and maintained complete operational training program.

- Successfully managed the project of transitioning an operations team from one physical location to another following a departmental reorganization.

EDUCATION

- Ph.D., Human Capital Management (Begin August, 2014)Bellevue University
- M.S., Organizational Performance (November 2013) Bellevue University
- B.S., Business Management with an emphasis in Communication (March 2011) Bellevue University
- Business Analysis Certification (March 2011) University of California, Davis
- Project Management Certification (December 2008) University of California, Davis
- A.A., Business Management with an emphasis in Communication (December 2008) University of Phoenix

CERTIFICATIONS

- Resolute Hospital Billing Administrator, Epic (2012)
- Single Billing Office Administrator, Epic (2012)
- Home Health Billing, Epic (2012)
- Hospice Billing, Epic (2012)
- Certified Massage Practitioner (2013)

TECHNOLOGIES

- Windows
- Microsoft Office (Visio, PowerPoint, SharePoint, Word, Excel, Project, Outlook, and Access)
- Lotus Notes
- Epic
- Facets
- SalesForce
- NASCO

10. Response to Cost Worksheet, Attachment B

Attachment B: Paid Deliverable Cost Table

Del #	Deliverable	Subtotal	Holdback (10%)	Total Cost
1.1	Project Management Plan	$24,525	$2,725	$27,250
2.1	Detailed System Requirements & Traceability Matrix	$90,000	$10,000	$100,000
3.1	Entity-Relationship Diagram	$40,500	$4,500	$45,000
3.2-3.3	Design document	$90,000	$10,000	$100,000
4.1	Data layer – “Empty” Database	$45,000	$5,000	$50,000
4.2	Logic layer – Unit Testing Results	$135,000	$15,000	$150,000
4.3	Interface layer – Draft Web Pages	$108,000	$12,000	$120,000
5.1-5.4	Test Plans & Reports	$225,000	$25,000	$250,000
6.1	Data Conversion	$225,000	$25,000	$250,000
6.2	Final Web Pages	$90,000	$10,000	$100,000
6.3-6.6	Training Plans, Materials, & Sessions	$72,000	$8,000	$80,000
6.6	Ready-to-Deploy System	$67,500	$7,500	$75,000
6.7	Final System Deliverable: Deployment, Transition, Warranty Period & Acceptance Document	$90,000	$10,000	$100,000
	Unanticipated Work	$45,000	$5,000	$50,000
Totals		**$1,347,525**	**$149,725**	**$1,497,250**

Attachment B: Project Team Staff and Rates Table

Staff Name	Job Title or Classification	Hours	Rate Per Hour	Extended Total	Deliverable Number
Amit Rai	Project Manager	2530	$130.00	$ 328,900.00	1.1, 2.1, 3.2, 3.3, 6.6, 6.7, 4.2
Sverre Schiotz	Sr. Tech Lead	2672	$125.00	$ 334,000.00	2.1, 3.1, 3.2-3.3, 4.1, 4.2, 6.1, 6.6, 6.7
Greg Harvey	Programmer	1650	$115.00	$ 189,750.00	3.1, 3.2-3.3, 4.1, 4.2 6.1
Hemal Mehta	Programmer	1920	$115.00	$ 220,800.00	3.2-3.3,4.3, 6.2, 6.6, 6.7
Jessica Hovdesven	Systems Analyst	2552	$105.00	$ 267,960.00	2.1, 3.2, 4.3 5.1-5.4, 6.3-6.6 6.7
Athina Addison	Systems Analyst	1008	$105.00	$ 105,840.00	5.1-5.4, 6.3-6.6
TBD	Programmer	400	$125.00	$ 50,000.00	Unanticipated Work
Grand Total				**$1,497,250.00**	

11. Response to Offeror&Consultant References, Attachment C

Firm References

REFERENCE # 1	
1. Offeror or Consultant Info	
Name: Trinity Technology Group, Inc.	Primary Contact Phone Number: 916-779-0201
Reference is for: ☒Offeror ☐Consultant ☐Both (if same)	
2. Client info	
Client Name: CA Air Resources Board	Contact Name: Christina Zhang Tillman
Address: 1001 I Street	Contact Phone: 916-322-2990
3. Project/ Work info	
Name of Project: Low Carbon Fuel Standard Tracking System	Dates Served on Project (from/to): 06/01/10 – 02/14/11
Project Description: As part of AB32, the Low Carbon Fuel Standard system was initiated by ARB in order to provide a web based method for transportation fuel vendors nationwide to submit fuel data on a quarterly basis, and calculate carbon deficits/credits based upon the number and type of transactions. The development had originally been undertaken in-house, but ARB sought assistance in completing the solution as the state deadlines for implementing the fuel standard reporting were quickly approaching. In only three months, TrinityTG analyzed the existing system and made significant rewrites to the original code in order to create a three-tiered .NET web application, which included the following functionality: • Account Management • Bulk data upload via XML • Automated data validation and exception reporting • Workflow approval • Annual Reporting The LCFS also adopted the look and feel of the ARB website, making it a relatively seamless portion of the existing website.	
Offeror or Consultant Involvement on the Project: TrinityTG provided full software development lifecycle services, including: • Project Management	

• Analysis • Design • Development • System Testing • Implementation/Deployment • Training • Post-Implementation Support			
Deliverables Prepared By Offeror or Consultant: • Project Management Plan • UI Prototype • Detailed Design • Training Plan • Testing Plan • Implementation Plan • Source Code			
4. Project Measurements and Results			
Original estimated hours on project: 2900	Actual hours on project: 2900		
		YES	NO
Was the project or contract terminated prior to successful conclusion? If "yes," please explain the reason.			x

REFERENCE # 2	
1. Offeror or Consultant Info	
Name: Trinity Technology Group, Inc.	Primary Contact Phone Number: 916-779-0201
Reference is for: ☒Offeror ☐Consultant ☐Both (if same)	
2. Client info	
Client Name: Bay Area Air Quality Management District	Contact Name: Anthony Fournier
Address: 939 Ellis Street, San Francisco, CA, 94109	Contact Phone: (415) 749-4961
3. Project/ Work info	
Name of Project: Carl Moyer Grant Incentive Information System (IIS)	Dates Served on Project (from/to): 07/15/09 – 04/15/10 (Implementation) 04/15/10 – Present (Maintenance)

Project Description:

The Bay Area Air Quality Management District sought to automate the intake, review, approval and maintenance of grant applications received throughout the region for the Carl Moyer incentives program, which provides transportation vendors with funding to replace or retrofit high emitting devices.

The IIS is a .NET web application that provides public access to submit grant applications. Internally, the system provides a fully automated calculation and workflow process to determine grant effectiveness, approve the grant, and maintain funding information for the year. The system includes the following functionality:

- Account Management and Registration for primary and third party applicants
- “Wizard” based screen flow for capturing grant applications
- Tab-based navigation for internal reviewers
- Automated emission calculations that vary by application and equipment type
- Workflow approval
- Annual Reporting
- Contract management
- Accounting and Invoicing

Offeror or Consultant Involvement on the Project:

TrinityTG provided full software development lifecycle services, including:

- Project Management
- Analysis
- Design
- Development
- System Testing

• Implementation/Deployment • Training • Post-Implementation Support		
Deliverables Prepared By Offeror or Consultant: • Requirements Document • Environment Specification • UI Prototype • Detailed Design • Training Plan • Testing Plan • Implementation Plan		
4. Project Measurements and Results		
Original estimated hours on project: 3500	Actual hours on project: 3750 (does not include ongoing M&O hours)	
	YES	NO
Was the project or contract terminated prior to successful conclusion? If "yes," please explain the reason.		x

REFERENCE # 3	
1. Offeror or Consultant Info	
Name: Trinity Technology Group, Inc.	Primary Contact Phone Number: 916-779-0201
Reference is for: ☒Offeror ☐Consultant ☐Both (if same)	
2. Client info	
Client Name: California Correctional Health Care Services	Contact Name: Van Dang
Address: 8260 Longleaf Dr. Elk Grove, CA 95758	Contact Phone: 916-691-3422
3. Project/ Work info	
Name of Project: Dental Scheduling Tracking System (DSTS)	Dates Served on Project (from/to): 06/25/12 – 08/15/13

Project Description:

CA Correctional Health Care Services is responsible for managing the delivery of health care across all 34 state correctional institutions. Part of this care includes dental care, which requires scheduling inmates based upon the type of treatment needed and location. Each institution had a separate Access database for managing this scheduling, making ongoing reporting to the Receivership difficult. TrinityTG was engaged to build and deploy a custom .NET web application that provided all institutions with a common platform for scheduling dental services across the enterprise.

The system provided scheduling specialists with a real-time availability of the inmate's scheduling, dentist's schedule, and correctional officer's schedule. The system interfaced with the State's Offender Management System (SOMS), as well as the state's health care data store (HCODS) to provide an integrated view of inmate data. Upon implementation, the system was one of the first .NET web applications to be successfully deployed to 100% of the state's institutions.

Offeror or Consultant Involvement on the Project:

TrinityTG provided full software development lifecycle services, including:

- Project Management
- Design
- Development
- System Testing
- Implementation/Deployment
- Post-Implementation Support

Deliverables Prepared By Offeror or Consultant:

- UI Prototype
- Detailed Design
- Training Plan
- Testing Plan
- Implementation Plan
- Conversion Plan

4. Project Measurements and Results		
Original estimated hours on project: 7450	Actual hours on project: 7400 (does not include M&O hours)	
	YES	NO
Was the project or contract terminated prior to successful conclusion? If "yes," please explain the reason.		x

Amit Rai References

REFERENCE #1	
1. Offeror or Consultant Info	
Name: Amit Rai	Primary Contact Phone Number: 704-763-4289
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: California Government Business Oversight	Contact Name: Danny Stratton
Address: 1515 K Street, Sacramento CA 95814	Contact Phone: 916-327-9033
3. Project/ Work info	
Name of Project: DocQNet	Dates Served on Project (from/to): June 2013-Present
Project Description: DOCQNET is a customized licensing, enforcement, and case management system that replaced over 50 legacy applications at the Department of Business Oversight. Built using Microsoft Dynamics xRM, SharePoint, SQL Server, and the .NET Framework, DOCQNET supports 5 business divisions in the licensing, compliance, and tracking of financial institutions in the state. It makes use of OTech's Tenant Managed Services, providing DBO with a brand new enterprise platform for hosting a number of applications. DOCQNET supports nearly 300 internal users, and provides a web portal for self-services access to license filing, fee payments, report filing, and complaint submission to nearly 400,000 licensed entities.	
Offeror or Consultant Involvement on the Project: Responsible for the delivery of Track 1 of the licensing system. Managing a team of developers, analysts, and testers. Conducted sessions with the client's team to gather requirements and review functional design documents. Conducted sessions with client to review Technical Design documents. Created and managed schedules of different phases of the project. Managing risks, issues and change requests.	
Deliverables Prepared By Offeror or Consultant: Use Cases, Business Requirements Document, Business Rules Mapping, Process Flow Diagrams, Status Reports, Test Scripts/Scenarios, among others	
4. Project Measurements and Results	
Original estimated hours on project: 1600	Actual hours on project: 1915

	YES	NO
Was the project or contract terminated prior to successful conclusion? If "yes," please explain the reason.		X

REFERENCE #2	
1. Offeror or Consultant Info	
Name: Amit Rai	Primary Contact Phone Number: 704-763-4289
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: California Department of Motor Vehicles	Contact Name: Thomas Miller
Address: Sacramento, CA 95814	Contact Phone: 916-657-9957
3. Project/ Work info	
Name of Project: Automated Knowledge Testing System and Expansion and Field Office Application enhancements	Dates Served on Project (from/to): July 2012-May 2013
Project Description: Automated Knowledge Testing System and Expansion: A java based statewide web application that allows California Residents to take Driver knowledge text exams on touch based User Interface. First stage of the software was successfully deployed in Stockton office. Field Application Enhancements were completed as part of the effort: • Mobile web application for scheduling appointments • Sending automatic renewal email reminders	
Offeror or Consultant Involvement on the Project: Worked as Project Manager to lead all phases of SDLC and statewide deployment of AKTE (Automated Knowledge Testing System Expansion). Managed a team of five. Responsible for creating and managing schedule, risks, issues, and status reports. Worked as Technical Lead for the first phase of AKTE. Designed and co-developed an automated process to help client scan vehicles due for registration and send email notifications. Optimized the process to handle expected increase in load in the future. Lead the effort to design and develop UI for the mobile site using JQUERY. (https://www.dmv.ca.gov/foa/welcome.do?lang=en (please use mobile device).	
Deliverables Prepared By Offeror or Consultant: Project Schedule, Risk Reports, Status Reports and numerous others.	
4. Project Measurements and Results	
Original estimated hours on project: 1600	Actual hours on project: 1600

	YES	NO
Was the project or contract terminated prior to successful conclusion? If "yes," please explain the reason.		X

REFERENCE #3	
1. Offeror or Consultant Info	
Name: Amit Rai	Primary Contact Phone Number: 704-763-4289
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: State of South Carolina	Contact Name: Dvendra Dupta
Address: P.O. Box 1469, Columbia, SC 29202-1469	Contact Phone: 516-798-9295
3. Project/ Work info	
Name of Project: South Carolina Child Support and Enforcement System	Dates Served on Project (from/to): April 2007-April 2010
Project Description: An Asp.Net based full function child support system for state of South Carolina. The system was built to implement Family Court Case Management and the State Disbursement Unit.	
Offeror or Consultant Involvement on the Project: Responsible for delivery of technical design and code for Case Initiation and Management module in Child Support Enforcement System spanning 50+screens, 500+ business rules, 20+ forms and reports and 20+ data exchanges. Conducted sessions with functional team to review functional document and analysis model. Presented and delivered detail design artifacts to client for approval. Managed Jira to track all software development phases. Hired, mentored, coached and supervised team and helped members take on greater responsibilities. Managed a team of 10+ developers, business analyst and testers. Developed and managed schedule for Case Initiation and Management team.	
Deliverables Prepared By Offeror or Consultant: Functional Document, Analysis Model, Status Reports, Business Process Flows, Business Requirements Document, among others	
4. Project Measurements and Results	
Original estimated hours on project: 5800	Actual hours on project: 5800

	YES	NO
Was the project or contract terminated prior to successful conclusion? If “yes,” please explain the reason.		X

Sverre Schiotz References

REFERENCE #1	
1. Offeror or Consultant Info	
Name: Sverre Schiotz	Primary Contact Phone Number: 916-690-4214
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: Troy Group, Inc.	Contact Name: David Altfeder
Address: 3 Bryan Drive, Wheeling WV 26003	Contact Phone: 910 691-1241
3. Project/ Work info	
Name of Project: Employee; Senior Software Engineer	Dates Served on Project (from/to): 9/2011 – 5/2013
Project Description: Custom Secure Check Printing Solutions	
Offeror or Consultant Involvement on the Project: Created Customized web application check printing installations. Using MapForce, C# and XtraReports create custom file parsers, print job parsers, check templates and configurations for web application and printing service. Provided installation and production support.	
Deliverables Prepared By Offeror or Consultant: Custom file parsers, print job parsers, check templates and configurations for web application and printing service	
4. Project Measurements and Results	
Original estimated hours on project: None; Employee	Actual hours on project:

	YES	NO
Was the project or contract terminated prior to successful conclusion? If "yes," please explain the reason.		X

REFERENCE #2	
1. Offeror or Consultant Info	
Name: Sverre Schiotz	Primary Contact Phone Number: 916-690-4214
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: RSVP Communications	Contact Name: Jim Weesies
Address: 8765 W Market St, Greensboro, NC 27409	Contact Phone: (336) 668-2423
3. Project/ Work info	
Name of Project: High Point Market	Dates Served on Project (from/to): Dec 2007 – April 2008
Project Description: Update an existing Web driven phone center call script. Previous call script had a single top down progression. New call script had 5 different versions and each version had several branches depending on answers to the questions	
Offeror or Consultant Involvement on the Project: Update an existing Web driven phone center call script. Previous call script had a single top down progression. New call script had 5 different versions and each version had several branches depending on answers to the questions.	
Deliverables Prepared By Offeror or Consultant: Updated Web Site and Database.	
4. Project Measurements and Results	
Original estimated hours on project: 150	Actual hours on project: 235

	YES	NO
Was the project or contract terminated prior to successful conclusion? If "yes," please explain the reason.		X

REFERENCE #3	
1. Offeror or Consultant Info	
Name: Sverre Schiotz	Primary Contact Phone Number: 916-690-4214
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: California Energy Commission	Contact Name: Betty Chrisman
Address: 1516 9th Street, MS5 Sacramento, CA 95814	Contact Phone: (916) 654-3948
3. Project/ Work info	
Name of Project: Appliance Database	Dates Served on Project (from/to): 11/2005 – 5/2010
Project Description: Convert the California Energy Commission's Appliance Certification Program's Appliance Database Client/Server VB6/SQL Server 2000 Application to an ASP.NET/VB.NET/SQL 2005 Web Base Application.	
Offeror or Consultant Involvement on the Project: Contractor analyzed the old application and designed, developed, programmed and installed the new Web Application. As well as trained staff and performs continued maintenance, which included adding new features and changing validation as the Appliance Regulations Changed.	
Deliverables Prepared By Offeror or Consultant: Database, Business Layer and Web Application.	
4. Project Measurements and Results	
Original estimated hours on project: 4000	Actual hours on project: 4300

	YES	NO
Was the project or contract terminated prior to successful conclusion? If "yes," please explain the reason.		X

Hemal Mehta References

REFERENCE #1	
1. Offeror or Consultant Info	
Name: Hemal Mehta	Primary Contact Phone Number: 916-468-2794
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: California Correctional Health Care Services (CCHCS)	Contact Name: Dr. Michael Barks
Address: 9260 Laguna Springs Dr., Elk Grove, CA 95758	Contact Phone: 916-691-0253
3. Project/ Work info	
Name of Project: Dental Scheduling and Tracking System (DSTS)	Dates Served on Project (from/to): Jun-2012 to Dec-2013
Project Description: The Dental Scheduling Tracking System (DSTS) was developed to replace the IDTD (Interim Dental Tracking Database) that was developed in-house by the dental staff. DSTS is currently being used across all 35 institutions in the State of California for tracking and scheduling dental appointments.	
Offeror or Consultant Involvement on the Project: Lead UI developer on the project. Design, develop, configure, test, deploy and support the new Dental Scheduling Tracking System (DSTS) using MS ASP.NET, WCF, and SQL Server technologies.	
Deliverables Prepared By Offeror or Consultant: System Design Document, Build and Deployment Document.	
4. Project Measurements and Results	
Original estimated hours on project:	Actual hours on project: 2942

	YES	NO
Was the project or contract terminated prior to successful conclusion? If “yes,” please explain the reason.		X

REFERENCE #2	
1. Offeror or Consultant Info	
Name: Hemal Mehta	Primary Contact Phone Number: 916-468-2794
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: California Correctional Health Care Services (CCHCS)	Contact Name: George Fellines
Address: 9260 Laguna Springs Dr., Elk Grove, CA 95758	Contact Phone: 916-691-0254
3. Project/ Work info	
Name of Project: Dental Scheduling and Tracking System (DSTS)	Dates Served on Project (from/to): Jun-2012 to Dec-2013
Project Description: The Dental Scheduling Tracking System (DSTS) was developed to replace the IDTD (Interim Dental Tracking Database) that was developed in-house by the dental staff. DSTS is currently being used across all 35 institutions in the State of California for tracking and scheduling dental appointments.	
Offeror or Consultant Involvement on the Project: Lead UI developer on the project. Design, develop, configure, test, deploy and support the new Dental Scheduling Tracking System (DSTS) using MS ASP.NET, WCF, and SQL Server technologies.	
Deliverables Prepared By Offeror or Consultant: System Design Document, Build and Deployment Document.	
4. Project Measurements and Results	
Original estimated hours on project:	Actual hours on project: 2942

	YES	NO
Was the project or contract terminated prior to successful conclusion? If “yes,” please explain the reason.		X

REFERENCE #3	
1. Offeror or Consultant Info	
Name: Hemal Mehta	Primary Contact Phone Number: 916-468-2794
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: Pondera Solutions Inc.	Contact Name: Don Carter
Address: P.O. Box 1446, Diamond Springs, CA 95916	Contact Phone: 916-601-4398
3. Project/ Work info	
Name of Project: Medicaid Behavioral Health Services Fraud Analytics	Dates Served on Project (from/to): Jan-2014 to Mar-2014
Project Description: The project implements the Pondera Fraud-Detection-as-a-Service solution which helps investigators in identifying potential fraudulent activity through the use of data validation, predictive analytics, link analysis, and geospatial analysis.	
Offeror or Consultant Involvement on the Project: Served as a .NET Developer on the project. Implemented User Interface using MVC architecture in Visual Studio 2012.	
Deliverables Prepared By Offeror or Consultant:	
4. Project Measurements and Results	
Original estimated hours on project:	Actual hours on project: 265

	YES	NO
Was the project or contract terminated prior to successful conclusion? If “yes,” please explain the reason.		X

Gregory Harvey References

REFERENCE #1	
1. Offeror or Consultant Info	
Name: Greg Harvey	Primary Contact Phone Number: 916-284-7384
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: Xerox State & Local Solutions, Inc.	Contact Name: Mark G Martorano
Address: 988 Wimbledon Drive Melbourne, FL 32940	Contact Phone: 321-258-4970
3. Project/ Work info	
Name of Project: California Highway Patrol CAD CRM	Dates Served on Project (from/to): March 2011 / March 2012
Project Description: Create a CRM combing 4 hubs for the California Highway patrol CAD system into one Central Repository Maintenance database via replication for instant data state wide.	
Offeror or Consultant Involvement on the Project: Consultant Develop replication model to combine 4 CHP hubs CAD systems into one central location. Designed horizontal partitioning table design to support very large California 911 system's data. Created reports as required by CHP for the new data model. Develop XML feed for CHP dashboard (seen every 15 seconds). Involved with weekly strategy meetings. Crossed trained CHP on code and reports created. Technical Environment: SQL Server 2008 R2, SQL Server Report Builder 3.0, SSRS	
Deliverables Prepared By Offeror or Consultant: Consultant	
4. Project Measurements and Results	
Original estimated hours on project: 2200	Actual hours on project: 2200

	YES	NO
Was the project or contract terminated prior to successful conclusion? If "yes," please explain the reason.		x

REFERENCE #2	
1. Offeror or Consultant Info	
Name: Greg Harvey	Primary Contact Phone Number: 916-284-7384
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: Pondera Solutions Inc.	Contact Name: Don Carter
Address: P.O. Box 1446 Diamond Springs, CA 95916	Contact Phone: 916-601-4398
3. Project/ Work info	
Name of Project: Medicaid Behavioral Health Services Fraud Analytics	Dates Served on Project (from/to): Jan-2014 to Mar-2014
Project Description: The project implements the Pondera Fraud-Detection-as-a-Service solution which helps investigators in identifying potential fraudulent activity through the use of data validation, predictive analytics, link analysis, and geospatial analysis.	
Offeror or Consultant Involvement on the Project: Performance and tuning. Creating stored procedures to optimize backend performance. Recommendation on indexing and schema layout.	
Deliverables Prepared By Offeror or Consultant:	
4. Project Measurements and Results	
Original estimated hours on project: 228	Actual hours on project: 228

	YES	NO
Was the project or contract terminated prior to successful conclusion? If “yes,” please explain the reason.		x

REFERENCE #3	
1. Offeror or Consultant Info	
Name: Greg Harvey	Primary Contact Phone Number: 916-284-7384
Reference is for: ☐Offeror ☒Consultant ☐Both (if same)	
2. Client info	
Client Name: TekSystems Inc.	Contact Name: Leo Di Benedetto, SR IT Recruiter-Healthcare
Address: 2969 Prospect Park Drive Suite 150 Rancho Cordova, CA 95670	Contact Phone: 916-859-3256
3. Project/ Work info	
Name of Project: Blue Shield of California	Dates Served on Project (from/to): October 2012 – November 2012
Project Description: Migrate all existing servers license from 2000, 2005 2008 to SQL Server 2012.	
Offeror or Consultant Involvement on the Project: Contract position developing plan to migrate all version of SQL Server to version 2012. This includes all proper licensing conversions and moving physical servers to virtual server environments. New projects include converting Access Database to SQL Server. Several meetings for other projects helping with design ideas and project planning.	
Deliverables Prepared By Offeror or Consultant:	
4. Project Measurements and Results	
Original estimated hours on project: 300	Actual hours on project: 300

	YES	NO
Was the project or contract terminated prior to successful conclusion? If "yes," please explain the reason.		x

12. Response to STD 843

STATE OF CALIFORNIA – DEPARTMENT OF GENERAL SERVICES PROCUREMENT DIVISION

DISABLED VETERAN BUSINESS ENTERPRISE DECLARATIONS

STD. 843 (Rev. 5/2006)

Instructions: The disabled veteran (DV) owner(s) and DV manager(s) of the Disabled Veteran Business Enterprise (DVBE) must complete this declaration when a DVBE contractor or subcontractor will provide materials, supplies, services or equipment [Military and Veterans Code Section 999.2]. Violations are misdemeanors and punishable by imprisonment or fine and violators are liable for civil penalties. All signatures are made under penalty of perjury.

SECTION 1

Name of certified DVBE: C&G Technology Services, Inc. DVBE Ref. Number: 47514

Description (materials/supplies/services/equipment proposed): Developer

Solicitation/Contract Number: RFO # 13-409.00-007 SCPRS Ref. Number: _____ (FOR STATE USE ONLY)

SECTION 2

APPLIES TO ALL DVBEs. Check only one box in Section 2 and provide original signatures.

☑ I (we) declare that the DVBE is not a broker or agent, as defined in Military and Veterans Code Section 999.2 (b), of materials, supplies, services or equipment listed above. Also, complete Section 3 below if renting equipment.

☐ Pursuant to Military and Veterans Code Section 999.2 (f), I (we) declare that the DVBE is a broker or agent for the principal(s) listed below or on an attached sheet(s). *(Pursuant to Military and Veterans Code 999.2 (e), State funds expended for equipment rented from equipment brokers pursuant to contracts awarded under this section shall not be credited toward the 3-percent DVBE participation goal.)*

All DV owners and managers of the DVBE **(attach additional pages with sufficient signature blocks for each person to sign)**:

(Printed Name of DV Owner/Manager)	(Signature of DV Owner/ Manager)	(Date Signed)
Clifford L. Corrie/Owner		4/4/2014

Firm/Principal for whom the DVBE is acting as a broker or agent: _____ (Print or Type Name)
(If more than one firm, list on extra sheets.)

Firm/Principal Phone: _____ Address: _____

SECTION 3

APPLIES TO ALL DVBEs THAT RENT EQUIPMENT AND DECLARE THE DVBE IS NOT A BROKER.

☐ Pursuant to Military and Veterans Code Section 999.2 (c), (d) and (g), I am (we are) the DV(s) with at least 51% ownership of the DVBE, or a DV manager(s) of the DVBE. The DVBE maintains certification requirements in accordance with Military and Veterans Code Section 999 et. seq.

☐ The undersigned owner(s) own(s) at least 51% of the quantity and value of each piece of equipment that will be rented for use in the contract identified above. I (we), the DV owners of the equipment, have submitted to the administering agency my (our) personal federal tax return(s) at time of certification and annually thereafter as defined in *Military and Veterans Code 999.2*, subsections (c) and (g). *Failure by the disabled veteran equipment owner(s) to submit their personal federal tax return(s) to the administering agency as defined in Military and Veterans Code 999.2, subsections (c) and (g), will result in the DVBE being deemed an equipment broker.*

Disabled Veteran Owner(s) of the DVBE **(attach additional pages with signature blocks for each person to sign)**:

(Printed Name)	(Signature)	(Date Signed)

(Address of Owner)	(Telephone)	(Tax Identification Number of Owner)

Disabled Veteran Manager(s) of the DVBE **(attach additional pages with sufficient signature blocks for each person to sign)**:

(Printed Name of DV Manager)	(Signature of DV Manager)	(Date Signed)

Page ___ of ___

PRINT CLEAR

13. Response to STD 213

STATE OF CALIFORNIA
STANDARD AGREEMENT
STD. 213 IT (REVISED 08/11)

STANDARD AGREEMENT

FOR I.T. GOODS/SERVICES ONLY

	REGISTRATION NUMBER
PURCHASING AUTHORITY NUMBER 13-409.00-007	AGREEMENT NUMBER

1. This Agreement is entered into between the State Agency and the Contractor named below
   STATE AGENCY'S NAME
   California Energy Commission (hereafter called State)
   CONTRACTOR'S NAME
   Trinity Technology Group Inc. (hereafter called Contractor)
2. The term of this Agreement is:
3. The maximum amount of this Agreement is: $
4. The parties agree to comply with the terms and conditions of the following attachments which are by this reference made a part of the Agreement:

Statement of Work 62 pages
Master Services Agreement 2 pages
RFO 13-409.00-007 and Contractors bid response are hereby incorporated and made a part of this contract

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto.

CONTRACTOR		CALIFORNIA Department of General Services Use Only
CONTRACTOR'S NAME *(If other than an individual, state whether a corporation, partnership, etc.)* Trinity Technology Group Inc.		
BY *(Authorized Signature)*	DATE SIGNED (Do not type)	
PRINTED NAME AND TITLE OF PERSON SIGNING Randall E. Duart , Partner		
ADDRESS 2015 J Street, Suite 105, Sacramento CA 95811		
STATE OF CALIFORNIA		
AGENCY NAME		
BY (Authorized Signature)	DATE SIGNED (Do not type)	
PRINTED NAME AND TITLE OF PERSON SIGNING		
ADDRESS		☐ Exempt per

14. Response to 204

STATE OF CALIFORNIA-DEPARTMENT OF FINANCE

PAYEE DATA RECORD

(Required when receiving payment from the State of California in lieu of IRS W-9)

STD. 204 (Rev. 6-2003)

1

INSTRUCTIONS: Complete all information on this form. Sign, date, and return to the State agency (department/office) address shown at the bottom of this page. Prompt return of this **fully completed** form will prevent delays when processing payments. Information provided in this form will be used by State agencies to prepare Information Returns (1099). See reverse side for more information and Privacy Statement.

NOTE: Governmental entities, federal, State, and local (including school districts), are not required to submit this form.

2

PAYEE'S LEGAL BUSINESS NAME (Type or Print)
Trinity Technology Group

SOLE PROPRIETOR – ENTER NAME AS SHOWN ON SSN (Last, First, M.I.)

E-MAIL ADDRESS
trinity@trinitytg.com

MAILING ADDRESS	**BUSINESS ADDRESS**
2015 J Street, Suite 105	2015 J Street, Suite 105
CITY, STATE, ZIP CODE	**CITY, STATE, ZIP CODE**
Sacramento, CA 95811	Sacramento, CA 95811

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PAYEE ENTITY TYPE

CHECK ONE BOX ONLY

ENTER FEDERAL EMPLOYER IDENTIFICATION NUMBER (FEIN): 9 4 - 3 3 4 5 7 4 6

☐ **PARTNERSHIP**

☐ **ESTATE OR TRUST**

CORPORATION:
- ☐ **MEDICAL** (e.g., dentistry, psychotherapy, chiropractic, etc.)
- ☐ **LEGAL** (e.g., attorney services)
- ☐ **EXEMPT** (nonprofit)
- ☑ **ALL OTHERS**

☐ **INDIVIDUAL OR SOLE PROPRIETOR ENTER SOCIAL SECURITY NUMBER:** ___ - __ - ____

(SSN required by authority of California Revenue and Tax Code Section 18646)

NOTE: Payment will not be processed without an accompanying taxpayer I.D. number.

4

PAYEE RESIDENCY STATUS

☑ California resident - Qualified to do business in California or maintains a permanent place of business in California.

☐ California nonresident (see reverse side) - Payments to nonresidents for services may be subject to State income tax withholding.
- ☐ No services performed in California.
- ☐ Copy of Franchise Tax Board waiver of State withholding attached.

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I hereby certify under penalty of perjury that the information provided on this document is true and correct. Should my residency status change, I will promptly notify the State agency below.

AUTHORIZED PAYEE REPRESENTATIVE'S NAME (Type or Print)		**TITLE**
Randall E. Duart		Partner
SIGNATURE Randall E Duart	**DATE** 4/9/2014	**TELEPHONE** (916) 761-2349

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Please return completed form to:

Department/Office: _____

Unit/Section: _____

Mailing Address: _____

City/State/Zip: _____

Telephone: (___) _____ **Fax:** (___) _____

E-mail Address: _____

15. Copy of Offeror's MSA Contract

STATE OF CALIFORNIA
STANDARD AGREEMENT
STD. 213 IT (REVISED 08/11)

STANDARD AGREEMENT

FOR I.T. GOODS/SERVICES ONLY

REGISTRATION NUMBER	
PURCHASING AUTHORITY NUMBER	AGREEMENT NUMBER 5137002-130

1. This Agreement is entered into between the State Agency and the Contractor named below
   STATE AGENCY'S NAME
   DEPARTMENT OF GENERAL SERVICES (hereafter called State)
   CONTRACTOR'S NAME
   TRINITY TECHNOLOGY GROUP INC. (hereafter called Contractor)
2. The term of this Agreement is: March 4, 2014 or upon State's approval, whichever is later, through, March 3, 2017 with two 1 -year optional extensions
3. The maximum amount of this Agreement is: $ 0.00 (Zero dollars and no cents, with no guarantee of contract expenditure)
4. The parties agree to comply with RFP 5137002 and the terms and conditions of the following attachments which are by this reference made a part of the Agreement:

Attachment 1 - Rate Sheet (1 page)
Attachment 2* - GSPD401IT, Information Technology General Provisions, Effective 11/27/13 (electronic)
Attachment 3* - Information Technology Personal Services Special Provisions, Effective 02/08/07 (electronic)

(*) These documents available at https://www.dgs.ca.gov/pd/resources/modellanguage.aspx

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto.

CONTRACTOR		CALIFORNIA Department of General Services Use Only
CONTRACTOR'S NAME (If other than an individual, state whether a corporation, partnership, etc.) TRINITY TECHNOLOGY GROUP, INC.		
BY (Authorized Signature)	DATE SIGNED (Do not type) 2/19/2014	
PRINTED NAME AND TITLE OF PERSON SIGNING Randall E. Duart, President		
ADDRESS 2015 J Street, Suite 105, Sacramento CA 95811		
STATE OF CALIFORNIA		
AGENCY NAME DEPARTMENT OF GENERAL SERVICES		
BY (Authorized Signature) for JB	DATE SIGNED (Do not type) 2/25/14	
PRINTED NAME AND TITLE OF PERSON SIGNING Jim Butler, Deputy Director, Procurement Division		
ADDRESS 707 Third Street, 2nd Floor, West Sacramento, CA 95605		☐ Exempt per

IT Consulting Services, MSA Number 5137002-130
Trinity Technology Group Inc.
ATTACHMENT 1 – RATE SHEET

The hourly rates specified are guaranteed for the entire MSA term as the maximum hourly rates to be charged to user agencies. Contractor may offer lower hourly rates when responding to a user agency's Request for Offer (RFO), but **cannot offer higher hourly rates.**

HOURLY RATES, TIERS 1,2 & 3

Name	Sr. Project Manager Rate	Project Manager Rate	Sr. Tech Lead Rate	Tech Lead Rate	Sr. Programmer Rate	Programmer Rate	Systems Analyst Rate
Trinity Technology Group Inc.	$175	$140	$150	$130	$120	$125	$105