Application Portfolio Management Pilot
Report to Leadership
November 14, 2016

Texas Department of Information Resources

Contents

1. Executive Summary

1.1. Overview

In 2014 DIR collaborated with state agencies to perform a legacy systems study of agencies' business applications (HB 2738, 83R). This legacy systems study showed that more than half of 4000+ state agency business applications were dependent on hardware or software components that were obsolete or inefficient. The state recognized that agencies have limited visibility to guide decision-making for IT investment, or to balance business needs with maintaining the technology. Agencies needed a support structure to establish roadmaps to modernization. To that end, in 2015 the Legislature passed HB 1890, directing DIR to provide an Application Portfolio Management (APM) service that includes best practices and toolsets to assist agencies in managing applications. The bill authorized DIR to launch the service as a pilot before offering it statewide. This report describes findings, challenges, and recommendations related to the APM pilot.

1.2. Pilot findings

DIR developed the scope for the APM Pilot and used DIR Cooperative Contracts to procure services to support it. Seven agencies of various sizes participated in the pilot, ensuring cross-agency validation and input.

- Texas Department of Licensing and Regulations (TDLR)
- Texas Department of Public Safety (DPS)
- Texas Office of Courts Administration (OCA)
- State Office of Risk Management (SORM)
- Texas Parks and Wildlife Department (TPWD)
- Texas Workforce Commission (TWC)
- Department of Information Resources (DIR)

The following are highlights of team findings from the pilot activity. These findings will be invaluable in the creation of a full APM service procured via a formal solicitation process:

- The system should facilitate cost planning based on both high-level estimates and rolled-up detail.

- Accurate and complete data describing the systems is paramount; obtaining and maintaining it requires investment.

- A centralized approach to APM is needed for collecting and analyzing this data.

- Agencies with limited Configuration Management Database (CMDB) functions want APM to fill the gap.

- Agencies with mature CMDB solutions expect strong reconciliation between their CMDB and APM.

- Agencies want APM to describe the relationships and dependencies between their business applications.

- Associate business applications with disaster recovery and business continuity expectations.

- Effective agency-based governance of a shared APM service will be critical to its use and consistent configuration.

- The APM solution must provide value to agencies regardless of their application management maturity.

- Single-sign-on to APM using the agency's existing authentication source is a high demand.

- Support integration with Information Technology Financial Management (ITFM) systems for accurate financial information.

- The user experience must be straight-forward with good built-in help context.

- Training is a necessary component.

Agencies want to benefit from each other's knowledge and experiences as represented in the APM system, but they are concerned about levels of transparency (e.g. identifying security risk and potential political exposure). Governance must ensure appropriate constraints on content in the APM solution, restricting access such that state leadership, DIR, and other agencies only see content explicitly shared by agencies. However, certain categories of information should be generally available across the enterprise or represented in an aggregated, generalized form.

Agencies of all sizes see great value in having only one primary source of data for viewing their application roadmaps. They especially appreciate the ability to associate those systems with descriptive information in a standard, consistent way. Some agencies voiced concerns about the usefulness of a solution that would require manual monitoring in more than one location, with updates required in more than one system.

Reliable information on manufacturer product lifecycles is a high value; integration of that information across the APM system is critical. The 2014 legacy systems study reported over 100,000 software instances and over 10,000 server instances – a large technology footprint. A third-party provider is needed to manage the APM solution, given the magnitude and complexity of the environment, to scale with the Texas information technology investment.

Over all the pilot confirmed there was high value in testing a solution prior to entering a full procurement for a service that is not already widely adopted or familiar.

1.3. Challenges during the pilot

DIR was able to streamline the procurement of the pilot by utilizing existing DIR cooperative contracts. The available vendors with relevant solutions on those contracts do not have the most mature APM solutions, and our procurement evaluations did not give the pilot agencies a broad view of the market offerings. However, our chosen vendor's technical services were excellent and made the rest of the pilot process very productive.

Data collection, cleansing, and loading was cumbersome and constrained the time available for business users to use the system. Some agencies were highly involved in the process and committed to vetting the system while others had minimal investment. But this range of behavior during the pilot enabled DIR to better understand agencies' demand, resource constraints, and cultures of resistance to change.

APM has value across the agency leadership landscape: executive leadership, business owners, and information technology (IT) stewards. However, during the pilot we found it difficult for some agency IT organizations to engage with these other leaders. Integrating the solution with an agency's existing process requires additional time investment by the agency.

1.4. Recommendations

The pilot confirmed the viability of an APM solution. DIR should design, procure, and offer the APM service to all interested agencies. DIR has the budget and authority to initiate the service and should proceed with the procurement process by releasing a request for offer (RFO) to the larger vendor community for software and services.

CMDB integration with the APM solution should be provided as part of the service for all systems supported in the DIR Data Center Service (DCS) program. This should be a second phase of the deployment once the high-level functions of the system have been adopted by users of the system. Integration with non-DCS CMDBs should be facilitated, but funded by the owning agency.

Structure the APM solution to support documentation of artifacts from the Texas Project Delivery Framework and configure reports in APM to support a consistent presentation of major projects to the Quality Assurance Team (QAT).

Because of the clarity and transparency provided by the system, with a more consistent model for characterizing the health and status of business applications, a higher legislative funding priority could be placed on applications managed and reported through the APM solution.

2. Project Overview

2.1. Purpose of Application Portfolio Management (APM) service and pilot

The goal of Application Portfolio Management is to describe the inventory of business applications and the resources (e.g., money, staff time, infrastructure) required to provide operational support of those applications over their lifetime. APM is closely connected to governance and how an agency: ensures that applications are aligned with agency business needs; maintains enterprise architecture (alignment of people, processes, technology); and tracks effective metrics to measure the value proposition of applications relative to each other within an agency (or state) portfolio. APM should guide the investment decisions for an application's lifecycle, particularly balancing between adding features, maintaining infrastructure currency, and modernizing the platform. Effective implementation of APM is an indicator of an organization's information technology services maturity and its posture to respond to business requirements.

Application portfolio management is used to:

- Identify application investment requirements
- Identify and tracks costs
- Establish application lifecycle expectations (at least estimations)
- Identify the lifecycles of the components supporting the business applications
- Measure, report, and adjust values and expectations
- Track against original expectations
- Track large changes to requirements over the life of the application
- Consolidate all the application aspects into a centralized repository

DIR facilitated this APM pilot with seven interested agencies to discover how an APM solution would be used by agencies of varying size and mission. Small, medium, and large agencies were selected with a range of business criteria such as licensing, high security, citizen facing service, etc. The process of implementing the pilot provided these agencies opportunities to dialog about how APM should work in their environments, what functions they would and would not use, necessary security structure, and governance that would support many different agencies in a multi-tenant service. The diversity of the agency teams was beneficial. The teams brought knowledge from focus areas such as infrastructure, project management, IT leadership, programming, security, and governance.

A pilot allowed for a lower initial investment using anticipated requirements. It demonstrated what worked, what didn't, and what were the considered to be more important components for a Texas system. The pilot provided a real-life environment with relevant data and users. This has allowed us to build a base of state participants who will be able to drive a more effective procurement initiative with relevant perspective for the choice of a final solution. That final solution should meet the most essential requirements of a full APM service and scale to support all state agencies.

2.2. APM value confirmed by the pilot

The use of APM will provide consistency in the modernization of state technology, enabling reliable review and continuous improvement across the state enterprise. It also allows agencies the opportunity to collaborate more effectively on similar business requirements. It can be one of the first steps to deploying statewide Master Data Management (MDM), Application Programming Interface (API) service registry, Enterprise Service Bus solutions, and proactively identifying security issues and risk for hardware and software.

Agencies have identified the following values for APM throughout the pilot:

- Consolidate related data from many different sources providing a single point of reference, visibility within an agency

- More efficiently track life cycles of business applications and their components

- More efficiently track dependencies and vulnerable components

- Being proactive in identifying security and risk assessment issues for both hardware and software

- More accurately identify ideal maintenance window times

- Identify the projected costs of applications through their life cycle in comparison to other applications

- Help a range of individuals understand what impact an event or component has on the overall business

- Enhance communications across IT and business units for strategic and fiscal planning

- Enable point-in-time evaluations of legacy status across the environments

2.3. Project narrative

HB 1890 directed DIR to develop and implement a shared application portfolio management program for state agencies that includes best practices and tools to assist state agencies in managing applications. The

bill authorized DIR to launch the program as a pilot with a limited number of state agencies to validate solutions before offering the program on a statewide basis. It also authorized DIR to contract for and offer the program to other entities under Section 2054.0565 (Use of Contracts by Other Entities).

Seven pilot agencies were identified:

Office of Court Administration (OCA)

State Office of Risk Management (SORM)

Texas Department of Information Services (DIR)

Texas Department of Licensing and Regulation (TDLR)

Texas Department of Public Safety (DPS)

Texas Parks and Wildlife Department (TPWD)

Texas Workforce Commission (TWC)

DIR created a Statement of Work (SoW) for the pilot APM environment and services, and released it in July 2015 to vendors with existing DIR cooperative contracts. DIR collaborated with a team of TPWD and DPS representatives to evaluate responses. Responses were completed by the end of July and evaluations started on July 24, 2015.

A significant value component of the evaluation process was the requirement that respondents demonstrate their product using a dataset provided by DIR.   Demonstrations were provided by a down-selected set of two vendors: CA Technologies (CA technical services and CA PPM SaaS) and Results Positive (HP Enterprise Services and HP Software Suite). The evaluation team awarded the pilot SoW to CA Technologies on August 31st, 2015, using the CA PPM Software as a Service (SaaS) solution and CA Technologies technical services.

DIR coordinated a pilot team kickoff and the first requirements/design workshop meetings took place with CA staff and state pilot agencies from September 2015 through November 2015. Agencies began entering data in the test environment in December and continued to test the design and functions through February 2016. Due to limitations with implementing business application assessment capabilities in the CA PPM, the team chose to leverage the existing SPECTRIM (RSA Archer) solution to build a more robust APM assessment process. Agencies progressed with data loads via templates and direct input via the CA APM user interface at different paces through March 2016.

The production environment was officially in use at the beginning of April 2016. The team developed a list of tasks/activities for users that would assist in the development of a report. Further steps were also taken to extend the "configuration" of the system. Business use by agencies' staff began in earnest from May 2016 through July 2016. DIR met with pilot agency teams during this time to get users started on tasks that would facilitate fiscal year planning - identifying projects that need to be initiated for various agency software and hardware components. Meanwhile, the CA APM continued to be configured to integrate with SPECTRIM and handle all business application assessment needs.

On August 6, 2016 DIR partnered with TPWD and CA to present the concept of APM at the annual TASSCC conference. Views from the pilot environment were used to represent the types of attributes and visualizations provided by an APM solution. The presentation was well received by a packed audience. Several agencies followed up, expressing interest in the current pilot and a future solution.

DIR has extended the subscription for the current pilot environment with CA and will support its use by existing pilot agencies and others until the deployment of a full offering. The next steps will be the development and release of an RFO for selection of a delivery model, toolset, and third party service provider to manage the service.

3. Key Concepts

Many findings identified key concepts that must be addressed in a full solution.

3.1. **CMDB integration**

Integration of the APM service with the DCS CMDB should be funded by DIR. Integration with CMDBs other than the DCS CMDB should be paid for by the owning agency. There is some concern regarding how to promote adoption of APM in this case. This will be a high cost item (~$50K-$100K one-time charge with ongoing service costs).

3.2. **Data import capability for key components**

Pilot agencies found it difficult to find a good starting point for data entry. Standards don't exist for current storage of information about hardware instances, software installations, or relationship mapping and much of that data is in excel spreadsheets unless a CMDB is being used. A consistent, well-defined import process can help normalize the existing data. And once it is defined, the process can speed the population of the APM service. The import capability needs to be flexible and user friendly, with mapping and reconciliation rules that ensure consistent refresh of the components.

3.3. **Data export**

The State must be able to maintain ownership of data and the service should facilitate movement to a replacement provider as needed. While the service itself should provide robust reporting and visualization, agencies expect to leverage external reporting tools. The service should support export of the data in a form that allows agencies to perform this external reporting. It should also support data integration with external systems.

3.4. **Visualizations**

Visualization of the data and systems provides insight for prioritization and value propositions when evaluating business applications' current state, dependencies, and future solutions. Visualizations provide all domains of an agency with these views via: value quadrants; business application roadmaps, relative to one another; prioritization comparisons based on value vs. cost; technology dependencies; and projects as milestones on a business application roadmap.

3.5. **Cost plans for business applications with roll-up of costs from components**

Investment prioritization and schedules for modernization are inherently dependent on the cost components at various levels of the application portfolio. Cost plans that associate those levels, and group them by business application, enable prioritization of business decisions.

3.6. Single-Sign-On

As more state systems require integrated services and authentication it is important that users are not burdened by increasingly fractured account management. Systems must leverage common identity and access management services with single-sign-on support.

3.7. Governance

The pilot confirmed the significant part governance plays in the smooth delivery and operation of the service. Identification and definition of attributes, presentation of workflow, coordination of configuration changes, updates to master products, and agreement on the level and type of information sharing are examples of activities that must be governed. Governance with effective representation by the customer base must also establish a consistent structure and support the use of State standards (e.g. data classification and security status).

3.8. Standard input of hardware and software names and attributes (EOL, EOS, RTM, etc.)

DIR made significant efforts with the 2014 Legacy Systems Study to normalize the discovered names and versions of software and hardware products to provide a consistent base for reporting age and status of installed products. The same consistency must exist in the APM solution and be constantly, reliably maintained.

This same information must be mapped with external CMDB's for effective reconciliation. The process will require automation and manual resources to maintain those relationships.

4. Appendix - Key pilot deliverables

4.1. Effective fulfillment of project goals

The following sections describe goals of the pilot project and the extent to which those goals were met.

4.1.1.   Implement the tools and processes needed to support APM practices for a set of approximately seven (7) pilot agencies. Projected schedule: The pilot project begins June 2015, software and technical services are acquired in August 2015, and the pilot provides recommendations by October 2016, with the potential to extend the services for the pilot agencies until a full program is implemented. Specific goals included:

4.1.1.1.   Populate the APM with at least 80% of each pilot agency's inventory of business applications, supporting hardware and software products, and the associated resources (e.g., money, staff time, and infrastructure) required to provide operational support of those applications over their lifetime. Complete this initial data population within five (5) months of APM software installation/setup.

Result: All agencies populated data in the system. Most chose to limit the inventory to a subset of 3-5 business applications and those application's software and hardware components

4.1.1.2.   Pilot the APM across agencies of varying size.

Result: Seven pilot agencies of small (SORM, OCA) medium (TPWD, DIR, TDLR) and large (TWC, DPS) participated.

4.1.1.3.   Enable agencies to identify whether business applications are aligned with agency business needs and enterprise architecture (alignment of people, processes, technology), and track effective metrics to measure the cost and value proposition of business applications relative to each other within an agency (or state) portfolio.

Result: The pilot supported assessment of business applications and represented business and technical value by visualizations and data points. There is room to expand the representation of alignment of people and process. The pilot environment provided strong relationship mapping between technology components and services.

4.1.1.4.   Provide dashboard and reporting information to a range of business and information technology users in support of investment decision-making for an application's lifecycle, particularly balancing between adding features, maintaining infrastructure currency, and modernizing the platform.

Result: The dashboard functionality was well tested by IT staff from the agencies, but had less exposure to a broad range of business users (product owners and financial managers). The timeframe of the pilot provided for conceptual evaluation of application lifecycle decision making, but not enough time for practical adoption by an agency.

4.1.1.5. Identify the level of effort required by the varied sized agencies to participate in this pilot. DIR will use this information as a benchmark basis for recommendations regarding full program implementation.

Result: The pilot provided a good degree of perspective on the needs of different sized agencies. Generally, the adoption and investment levels by an agency correlated with the vision of the leadership more than with the size and number of resources in an agency.

4.1.1.6. Identify viable chargeback mechanisms to support a full program service offering.

Result: The value of the service to agencies and the state overall, as well as the requests voiced by pilot agencies for DIR, determined DIR's decision to self-fund the initial APM service offering. DIR can re

4.1.2. The Evaluation Team will review the viability of the pilot, as implemented, against the business requirements identified in this Statement of Work and legislative intent. The Evaluation Team will develop recommendations related to the continuation of a full program service offering to any state agency, with implementation of changes based on lessons learned; or closure of the program.

4.1.2.1. Identify improvements and components to retain: software, services, governance, model, etc.

Result: This report calls out specific areas that should be improved and retained for a full program service. The pilot was able to address a large majority of the original requirements and revealed areas of significance.

4.1.2.2. Create an actionable guide, documentation standards, and templates for implementing an APM service program that can serve small, medium or large state agencies.

Result: This report and its related artifacts provide guidance for creation of an APM program. The documentation generated from the design requirements, the data templates, and the taxonomy of attributes establish a strong framework for implementing the service.

4.1.2.3. Document the effectiveness of the pilot against the project goals and objectives.

Result: Completed in this report, project management tool, and artifacts.

4.2. Effective fulfillment of software and technical services

The pilot was guided by requirements defined in a statement of work used to obtain software and technical services. The following section content lists those requirements and the extent to which they were met.

4.2.1. Software Requirements

4.2.1.1. **Business Capability**: Align business applications with agency business needs

Functions:

4.2.1.1.1. Describe the inventory of business applications and all components - **Met**

4.2.1.1.2. Describe the resources required to provide operational support over the lifetime of all business applications. – **Partially met**

4.2.1.1.2.1. Pre-built structure to capture relationships between financial costs (Development and operational support, hardware and software maintenance costs, etc.) – **Minimally met**

4.2.1.1.2.2. Provide workflow structure for governance of the business applications – **Not met**

4.2.1.1.2.3. Provide structure and processes that support how an organization ensures business applications are aligned with:

4.2.1.1.2.3.1. Business needs – **Partially met**

4.2.1.1.2.3.2. Enterprise Architecture – **Partially met**

4.2.1.1.2.3.3. Tracking metrics that measure cost/value proposition of business applications relative to each other within an organization's portfolio, or across organizations within an enterprise - **Partially met**

4.2.1.1.2.4. Guide the investment decisions for the lifecycle of all business applications - **Met**

4.2.1.1.2.5. Provide visualizations and reporting at varying levels of detail:

4.2.1.1.2.5.1. Dashboards - **Met**

4.2.1.1.2.5.1.1. Modular view of multiple chart styles and roadmap layout – **Met**

4.2.1.1.2.5.1.2. Drill down capability for any chart or roadmap to show detail – **Minimally Met**

4.2.1.1.2.5.1.3. Dynamic views by category of service, lifetime, priority, cost, value - **Met**

4.2.1.1.2.5.2. Dynamically generated views at various levels of abstraction of relationships based on business area, business applications, hardware and software components, and funding – **Significantly met**

4.2.1.1.2.5.3. Roadmaps that provide visual presentation of relationships:

4.2.1.1.2.5.3.1. Business applications' relationships and dependencies – **Significantly met**

4.2.1.1.2.5.3.2. Common hardware and software components across all business applications - **Met**

4.2.1.1.2.5.3.3. A business application to its supporting hardware and software components - **Met**

4.2.1.1.2.5.4. Lifecycles:

4.2.1.1.2.5.4.1. Business applications with their milestones (e.g., build, run/maintain, migrate, retire) - **Met**

4.2.1.1.2.5.4.2. Hardware and software components with Original Equipment Manufacturer (OEM) support milestones (e.g., Release date, End-of-Support, End-of-Life) - **Met**

4.2.1.1.2.5.4.3. Integration with a 3rd party structured catalog of vendor hardware and software product life cycles – **Not met**

        4.2.1.1.2.5.4.4.   Hardware and software components with customer designated use milestones - **Met**

     4.2.1.1.2.5.5.   Interdependencies - **Met**

     4.2.1.1.2.5.6.   What-if analysis – **Not Met**

     4.2.1.1.2.5.7.   Ability to generate reports via on demand and/or scheduled reporting - **Met**

     4.2.1.1.2.5.8.   Ability to generate reports that show trends in data/information over time – **Not Met**

    4.2.1.1.2.6.   Measurement of organization's application portfolio management maturity – **Not Met**

4.2.1.2.   **Business Capability**: Provide data consistency for reliable review and continuous improvement of business applications

Functions:

    4.2.1.2.1.   Ability to perform business analytics using results from built-in survey tools, integrated feeds for normalized third party software and hardware data, a shared taxonomy, etc. – **Partially met**

    4.2.1.2.2.   Integration with 3rd party external Configuration Management Database (CMDB) products – **Not Met**

4.2.1.3.   **Business Capability**: Identify investment requirements for business applications

Functions:

    4.2.1.3.1.   Provide tracking for:

     4.2.1.3.1.1.   Estimation of costs to build, run, maintain – **Partially met**

     4.2.1.3.1.2.   Tracking and roll-up of actual costs – **Partially met**

    4.2.1.3.2.   Measurement of relative business value and return on investment – **Not met**

    4.2.1.3.3.   Integration with 3rd party project portfolio management products – **Not met**

4.2.1.4.   **Business Capability**: Establish lifecycle expectations for business applications

Functions:

    4.2.1.4.1.   Identify and track application lifecycle requirements and justifications including:

     4.2.1.4.1.1.   Creation - **Met**

     4.2.1.4.1.2.   Enhancement - **Met**

     4.2.1.4.1.3.   Modernization - **Met**

     4.2.1.4.1.4.   Retirement - **Met**

     4.2.1.4.1.5.   Dependencies - **Met**

4.2.1.5.   **Business Capability**: Measure, report, and adjust values and expectations - **Met**

4.2.1.6.   **Business Capability**: Enable rationalization across business, agency, and the enterprise – **Partially met**

Functions:

4.2.1.6.1. Provides pre-packaged structures to enable comparison of all APM business capability components across varying levels of the organizational structure – **Minimally met**

4.2.2. Operational Requirements

4.2.2.1. Provides multi-tenancy:

4.2.2.1.1. Same application structure hosts multiple agencies - **Met**

4.2.2.1.2. Common application service provides consistent security across agencies - **Met**

4.2.2.1.3. Data of all common tenant agencies can be rolled up for cross-agency queries or merged reports - **Met**

4.2.2.1.4. Clear lines of logical separation are maintained between agency tenants supporting varying levels of access to data (e.g., access by role and group to a data strata based on agency program area, agency, or enterprise access) - **Met**

4.2.2.2. Backup and recovery (Software as a Service [SaaS] solutions):

4.2.2.2.1. All backup and disaster recovery will be provided by the SaaS vendor. Data hosted off-site is accessible 99.5% including all planned and unplanned downtime. Planned downtime must be coordinated. – **Stated, but not tested**

4.2.2.2.2. All data is backed up every 24 hours at Respondent's site. Backup information will be stored in a different location from the computer center where the hosting servers are located. If restoration of data is required, the Respondent will, upon notification, restore the data within five business days. – **Stated but not tested**

4.2.2.3. Storage (SaaS solutions):

4.2.2.3.1. Content storage must be restricted to the continental United States - **Met**

4.2.2.3.2. Customer data under the protection of the Respondent (under its care, custody and control) must be returned to the Customer upon notice, with the data/metadata transferred in Comma Separated Value (CSV) file format that can be recovered for use within a Structured Query Language (SQL) compatible database environment – **Under evaluation**

4.2.2.4. Security:

4.2.2.4.1. Provide secure authentication, authorization, and access - **Met**

4.2.2.4.2. Provide for isolation of content and configuration based on user, groups, and agency - **Met**

4.2.2.4.3. Support third party directory services authentication - **Met**

4.2.2.4.4. Environmental Security - **Met**

4.2.2.4.5. Physical site security - **Met**

4.2.2.4.6. Computer software security - **Met**

4.2.2.4.7. Data access and storage security - **Met**

4.2.2.4.8. Client/user security - **Met**

4.2.2.4.9. Telecommunications security, and - **Met**

4.2.2.4.10. Network security - **Met**

4.2.2.5. System configuration:

4.2.2.5.1. Users are assigned the ability to perform configuration based on designated levels of access - **Met**

4.2.2.5.2. For SaaS, vendor provides base system management - **Met**

4.2.2.6. Patching services:

4.2.2.6.1. Patches shall be provided as part of the license and maintenance agreement. Provider performs installation and management of patches in SaaS deployments - **Met**

4.2.2.7. Report concurrent usage and total users for each level of access, functionality, and license type – **Partially Met**

4.2.3. Delivery model:

4.2.3.1. Software as a Service (SaaS) package - **Met**

4.2.3.2. Commercial off-the-shelf (COTS) software (Installation services provided by software vendor or reseller. Hosted in DIR Consolidated Data Center environment.) – **Not applicable, chose SaaS solution.**

4.2.4. Staff Requirements

The data to be stored in this system is considered confidential and sensitive. To protect the assets of the state (data), the Respondent will be required to ensure data protection controls comply with the requirements of Texas Administrative Code § 202, Information Security. Customers have the capability to ensure compliance through audit of the environment. These controls must include provision for the following conditions to be met:

4.2.4.1. All direct participants in the project must sign a Non-Disclosure Agreement with DIR that will be in effect until DIR formally releases signatories in writing. – **Met by blanket NDA**

4.3. Design requirements developed for implementation of the Pilot

DIR worked with pilot agency teams and CA Technologies to develop design requirements documentation. These artifacts are external documents and may be provided as a reference upon request.

4.4. Lessons learned

DIR captured lessons learned throughout the pilot process. These addressed areas such as the pilot solicitation process, requirements gathering and design for the pilot environment, usage, governance, and project management. These artifacts are external documents and may be provided as a reference upon request.