



ADOA - ASET

Arizona Strategic Enterprise Technology

Project Investment Justification

Version 01.01

A Statewide Standard Document for Information Technology Projects

Project Title: Materials Rewrite

| | |
|------------------------------|---------------------------------|
| Agency Name: | AZ Department of Transportation |
| Date: | 7/2/14 |
| Agency Contact Name: | Jesse MacDonough |
| Agency Contact Phone: | |
| Agency Contact Email: | |

I. Management Summary

The ADOT Intermodal Transportation Division's Materials Group has statewide labs which provide testing for preliminary engineering, design and acceptance of materials used in roadway construction projects. There are three software modules that support the Materials Group and capture over 50,000 test results annually for materials testing. These modules were written over 15 years ago with the PowerBuilder development platform, which uses the proprietary PowerScript language. ADOT has since migrated to the Microsoft Visual Studio development environment, and PowerBuilder is no longer being used. Finding resources skilled in using this diminishing development platform, or that even want to acquire the skills for it, is very difficult. Further, ADOT is facing challenges with filling Lab Technician positions due to salary constraints. Therefore, the Department must continue to rely on technology innovations and business process automation for efficiency gains. The current platform not only puts IT support for this important business function at risk, but also does not allow the systems to keep up with increasing demands for operational efficiency, performance measures and management information. For these reasons, replacing these legacy systems with a set of robust and integrated solutions employing contemporary technology is a business imperative.

II. Project Investment Justification (PIJ) Type

Yes No Is this document being provided for a Pre-PIJ / Assessment phase?

If Yes,

| | |
|---|----|
| Identify any cost to be incurred during the Assessment phase. | \$ |
| Based on research done to date, provide a high-level estimate or range of development costs anticipated for the full PIJ. | \$ |

Explain:

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Yes No Will a Request for Proposal (RFP) be issued as part of the Pre-PIJ or PIJ?

III. Business Case

A. *Business Problem*

The current applications were developed using Sybase's PowerBuilder development platform software.

The issues with the present system:

1. The systems are not in compliance with current IT Enterprise Architecture and Standards.
2. PowerBuilder modules are over 15 years old and require one FTE to maintain.
3. The Information Technology Group has only one resource remaining that is skilled in using PowerBuilder and the PowerScript language.
4. It is time consuming to look up test results and communicate the testing failures.
5. Users are unable to identify and track priority testing.
6. There is no integration between modules for sharing test results, which makes it cumbersome to compile all test results for project close-out.

7. Whenever specification changes are required, the developer must get involved in making the changes and manually apply the specification changes to existing test results in the database. This effort can take weeks to complete.

B. Proposed Business Solution

We propose to rewrite the following application modules and include the additional/evolved processes identified for automation:

1. Soil and Aggregate
2. Concrete Cylinder Report (CCR)
3. Asphalt Concrete (AC)

Additionally, we plan to implement web based technology with system and security standardization.

C. Quantified Benefits

| | |
|-------------------------------------|---------------------|
| <input checked="" type="checkbox"/> | Service enhancement |
| <input type="checkbox"/> | Increased revenue |
| <input checked="" type="checkbox"/> | Cost reduction |
| <input type="checkbox"/> | Problem avoidance |
| <input type="checkbox"/> | Risk avoidance |

Explain:

Rewriting these modules will minimize development time and costs by utilizing contemporary technology standards and data structures while leveraging functions and features already included in some of the current suite of materials applications. This approach will also ensure security compliance relative to Lightweight Directory Access Protocols (LDAP) and role-based, transaction-based access controls. Additionally, it will feature an Enterprise Architecture compliant IT platform by providing consistency across systems.

Further improvements are:

- Efficiency savings of an estimated 6,100 hours annually by implementing a materials checklist that will automate test results communication.
- Efficiency savings of an estimated 300 hours by implementing a dashboard view of all testing which requires action.
- Efficiency savings of an estimated 5,400 hours by implementing integration between modules so that all tests are visible without having to open and close each application for the Project Material Close-out process.
- Reduction of an estimated 180 hours annually in IT support costs by having the ability to access all the Materials systems through a web-based system thus eliminating the need for individual installations every time a system change is made.
- Allow integration with ADOT's Document Management repository.
- Enable ready access to historical data.
- Improved reporting and enhanced access to performance-based measurements and management information.

IV. Technology Approach

A. *Proposed Technology Solution*

| Software Item | Description |
|--------------------------|----------------------------------|
| Soil and Aggregate | Rewrite in C# .Net Web Framework |
| Concrete Cylinder Report | Rewrite in C# .Net Web Framework |
| Asphalt Concrete | Rewrite in C# .Net Web Framework |
| RAD Telerik Controls | Programming Software Tool |

B. *Technology Environment*

This project will rewrite the Soils and Aggregate, Concrete Cylinder Report, and Asphalt Concrete applications which were written over 15 years ago. They will be written for a .NET 4.5 Framework in an ASP.NET environment using Visual Studio 2012 development platform with C-Sharp (C#) and Java languages. These modules will conform to the latest ITG technology standards.

C. *Selection Process*

ITG conducted research and analysis, and met with Commercial-off-the-Shelf vendors that were leading candidates in the Construction industry (AASHTO and Oracle). They either did not have any materials testing modules or they did not support the specialized testing that ADOT does and required millions in investment for changing testing equipment.

V. Project Approach

A. *Project Schedule*

Project Start Date: 8/15/2014 **Project End Date:** 11/30/2015

B. Project Milestones

| | Major Milestones | Start Date | Finish Date |
|----|------------------------------------|------------|-------------|
| 1. | Build Soil and Aggregate Module | 8/15/2014 | 1/30/2015 |
| 2. | Build Checklist Module | 8/15/2014 | 12/30/2014 |
| 3. | Build Dashboard | 9/1/2014 | 12/30/2014 |
| 4. | Build Asphalt Concrete Module | 1/2/2015 | 5/31/2015 |
| 5. | Build CCR Module | 6/1/2015 | 9/30/2015 |
| 6. | User Acceptance Testing & Training | 10/1/2015 | 11/25/2015 |
| 7. | Implementation | 11/26/2015 | 11/30/2015 |

VI. Roles and Responsibilities

A. Project Roles and Responsibilities

| Name | Role | Responsibility |
|----------------------------------|------------------------|---|
| Bill Hurguy | Project Sponsor | Secure funding for the project and provide final decisions. |
| Chad Auker | Product Owner | Provide input to user stories and acceptance criteria. |
| Scott Weinland | Product Owner | Provide input to user stories and acceptance criteria. |
| Diane Ohde | Project Manager | Project Manager and Scrum Master |
| Stanley Soesilo | Technical Lead | System Architect, manage technical resources, design, and develop the system. |
| Consultant | Business Analyst | Research, analyze, and refine requirements. |
| Consultants (3) | Developer | Design and develop the system. |
| Hossain Ismail | Developer | Design and develop the system. |
| Showkat Elahi David Zacharaie | Quality Control | Develop Test Cases and Test Scripts. Complete QC testing and assist with UAT. |
| Josh Brown | Security Analyst | Perform security reviews. |
| FTE | Server Technician | Server configuration. |
| Scott Wang Traci Dennis | Database Administrator | Setup database and web services. Perform backups and restores. |

B. Project Manager Certification

| | |
|---|---|
| ✓ | Project Management Professional (PMP) Certified |
| ✓ | State of Arizona Certified |
| | Project Management Certification not required |

C. Full-Time Employee (FTE) Project Hours

| | |
|---------------------------------------|-------|
| Total Full-Time Employee Hours | 8,205 |
| Total Full-Time Employee Cost | \$ |

VII. Risk Matrix, Areas of Impact, Itemized List, PIJ Financials

VIII. Project Approvals

A. Agency CIO Review

| Key Management Information | Yes | No |
|--|-----|----|
| 1. Is this project for a mission-critical application system? | | ✓ |
| 2. Is this project referenced in your agency's Strategic IT Plan? | | ✓ |
| 3. Is this project in compliance with all agency and State standards and policies for network, security, platform, software/application, and/or data/information as defined in http://aset.azdoa.gov/security/policies-standards-and-procedures , and applicable to this project? If NO , explain in detail in the "XI. Additional Information" section below. | ✓ | |
| 4. Will this project transmit, store, or process sensitive, confidential or Personally Identifiable Information (PII) data? If YES , in the "XI. Additional Information" section below, describe what security controls are being put in place to protect the data. | | ✓ |
| 5. Is this project in compliance with the Arizona Revised Statutes (A.R.S.) and GRRC rules? | ✓ | |
| 6. Is this project in compliance with the statewide policy regarding the accessibility to equipment and information technology for citizens with disabilities? | ✓ | |

B. Project Values

The following table should be populated with summary information from other sections of the PIJ.

| Description | Section | Number or Cost |
|--|---|----------------|
| Assessment Cost (if applicable for Pre-PIJ) | II. PIJ Type - Pre-PIJ Assessment Cost | \$0 |
| Total Development Cost | VII. PIJ Financials tab | \$568,620 |
| Total Project Cost | VII. PIJ Financials tab | \$572,120 |
| FTE Hours | VI. Roles and Responsibilities | 8,205 |

C. Agency Approvals

| Contact | Printed Name | Signature | Email and Phone |
|---------------------------------------|----------------|-----------|-----------------|
| Project Manager: | Diane Ohde | | |
| Agency Information Security Officer : | Thomas Branham | | |
| Agency CIO: | Doanh Bui | | |
| Project Sponsor: | Bill Hurguy | | |
| Agency Director: | | | |

IX. Optional Attachments

A. *Vendor Quotes*

X. Glossary

| | |
|-------------------------------------|--|
| LDAP | Lightweight Directory Access Protocol is a directory service protocol that provides a mechanism used to connect to, search, and modify Internet directories. |
| PowerBuilder | An integrated development environment owned by Sybase, a division of SAP. |
| PowerScript | The programming language used in PowerBuilder for application development. |
| C# | A modern, general-purpose, object-oriented programming language. |
| Microsoft Visual Studio 2012 | An integrated development environment (IDE) created by Microsoft for its different programming languages. |
| Oracle | An American multinational computer technology corporation headquartered in Redwood City, California |
| AASHTOWare | An enterprise software suite used for transportation project design and management. |

XI. Additional Information

Links:

[ADOA-ASET Website](#)

[ADOA-ASET Project Investment Justification Information Templates and Contacts](#)

Email Addresses:

[Strategic Oversight](#)

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