ADOA-ASET

Project Investment Justification

Version 03.31.15

A Statewide Standard Document for Information Technology Projects

Project Title:

Arizona Enterprise Services Platform (AESP)

Agency Name:	Arizona Department of Administration (ADOA)
Date:	May 8, 2015
Agency Contact Name:	David Nale
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Hover for Instructions

I. 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:

Click here to enter text.

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

II. Business Case

*A. Business Problem**

Currently, State agencies, employees, businesses, and citizens face challenges when trying to access, share or utilize State data and services. Some of these challenges include:

- Business and technical inefficiencies due to the lack of a centralized, secure platform.
- Lack of reusability due to IT silos, resulting in agencies re-inventing the wheel to solve similar problems.
- The lack of a centralized and secure identity and profile management solution.
- The inability of State agencies to share and maintain information regarding their services in a centralized repository.
- Lack of ability for most State agencies to generate and grow revenue from data and services.

These challenges create inefficiencies that result in lost opportunities for a collaborative approach to developing enterprise level solutions within and between ADOA and other State agencies.

*B. Proposed Business Solution**

The Arizona Enterprise Services Platform (AESP) project proposes to develop a web-based multi-tenant and auto-scaling platform that will provide State agencies a central development and deployment location for applications and services. Development of a robust, centralized AESP platform will provide State agencies, employees, businesses, and citizens a means to improve accessibility and efficiency. This project will facilitate the development of a secure cloud-based infrastructure and platform service that ADOA-ASET can make available across the State. This platform will include orchestration, automation and monitoring capabilities to increase efficiencies, reduce costs, improve security, and assist agencies with cloud migration projects.

This platform will leverage various existing technologies and services and provide flexibility for future integration while creating the opportunity for new revenue streams for agencies. The platform will be built using Open Source technologies and Open Standards. This strategy will

provide the necessary scalability for the deployment to meet the enterprise needs of the State, without the expense of proprietary licensing costs. It will also accelerate the adoption of Open Source technologies within State agencies.

C. *Quantified Benefits**

- [x] Service enhancement
- [x] Increased revenue
- [x] Cost reduction
- [x] Problem avoidance
- [x] Risk avoidance

Explain:

Service enhancement will be achieved through new services that will be incorporated into the foundation of the platform. Services for this platform include the existing identity management function and Application Programming Interface (API) store, additional enterprise content management and workflow capabilities, and an enhanced security offering using multi-factor authentication (MFA) technology. The platform will also support the creation of additional services in a modular, reusable manner that will act as building blocks for future applications.

Increased revenue will be achieved by offering State agencies an electronic credit-card and check processing capability, and the ability to share and also sell applicable data, where permitted.

Cost reduction will be achieved by agencies easily accessing and utilizing the large amount of data the State already owns. This will decrease research and planning times, potentially speed up project implementations, and ensure all shared data is up-to-date and consistent across the State for those agencies utilizing the platform. Access and security requirements will be available through the platform. Web services and APIs can be developed and published rapidly. There will be increased reusability of services built by different agencies on the platform.

Problem avoidance will be achieved by ensuring that participating agencies gather information and services from a centralized location. This will reduce the possibility of separate agencies acting on different information from multiple sources, thereby increasing consistency. With multiple agencies developing on a common platform, the project is expected to promote collaboration, common problem solving, and wide adoption of best practices across the community of developers.

Risk avoidance will be achieved with the implementation of MFA providing a robust layer of security that will protect sensitive data.

III. Technology Approach

A. *Proposed Technology Solution**

The core of the platform will be developed using Apache Stratos middleware, which is a highly-extensible Platform-as-a-Service (PaaS) framework. This application server supports Apache Tomcat, PHP, and MySQL applications, and can be extended to support many more

environments on most all major cloud infrastructures. In lieu of implementing these services in the State Data Center (SDC), ADOA-ASET plans to utilize a 'Cloud First' strategy. By residing in the Amazon Web Services (AWS) cloud environment, the AESP can provide the shared services, scalability and business continuity needed to meet the expected level of growth across the enterprise.

The following components of the AESP solution architecture to be developed include:

User Interface (UI) – The UI is the visible portion of the application and provides the user with access to all functions required to find, create, edit, and report on records in the database. It will be web-enabled and transacting with the Application Programming Interface (API) manager via Representational State Transfer (REST) API and Extensible Markup Language (XML) web services. The UI will be made available through MyAZ.gov and will have limited mobile device functionality.

My Structured Query Language (MySQL) – MySQL is an open-source Relational Database Management application (RDBMS) that stores data in the form of related tables. A dedicated MySQL database will be developed for this solution inclusive of instances for development, testing, and production.

Application Server/Data Services Server (AS/DSS) – The Apache Stratos application server is a lean, open source, high-performance application server with Web application and Web services deployment and management capabilities. This serves as a data abstraction layer and provides isolation between the RDBMS and the rest of the platform. The application server connects to the underlying database using Java Database Connectivity (JDBC) and exposes the data as a Simple Object Access Protocol (SOAP) web service to the platform. This will prevent any dependency between the platform and the database technology. The application server will be customized appropriately to manage the interaction between the RDBMS and other layers of the solution.

Business Processing Server (BPS) – A customization of the BPS will be created specific to the application. It will be responsible for execution of business processes and workflows. The business processes orchestration will be written using the Business Process Execution Language (BPEL) standard and will be deployed on the BPS.

Business Rules Server (BRS) – BRS functionality will be developed for this solution and will provide capability for defining, deploying, monitoring, and maintaining business rules, and will make them available to other applications via secure, reliable web services. The BRS will support the Drools rule engine, which will enable customized rules authoring.

Business Activity Monitor (BAM) – A WSO2 framework component part, which when implemented, will bring application analytics capabilities to the AESP platform. This is a lean, fully-open source, complete solution for aggregating and analyzing data and presenting information about business activities. It provides real-time visibility into distributed complex systems, including service-oriented architecture (SOA) processes, transactions and workflows.

Enterprise Service Bus (ESB) – The ESB will serve as a single point of communication for web applications and will handle transforming, filtering, routing and mediation of SOAP or REST message requests to the platform.

API Manager (APIM) - APIM provides a solution for creating, publishing and managing all aspects of an API and its life cycle. The APIM consists of the API Gateway, API Store, and API Publisher.

Identity Server (IS) – IS provides secure identity management for enterprise web applications, services, and APIs by managing the identity and entitlements of the users, securely and efficiently, with access control and Single-Sign-On (SSO) capability.

Multi-Factor Authentication (MFA) – Implementation will provide a robust secure identity verification service option. This security mechanism requires more than one method of authentication from independent categories of credentials to verify a user's identity for a login or other transaction. It serves as a protection for digital assets and customer data.

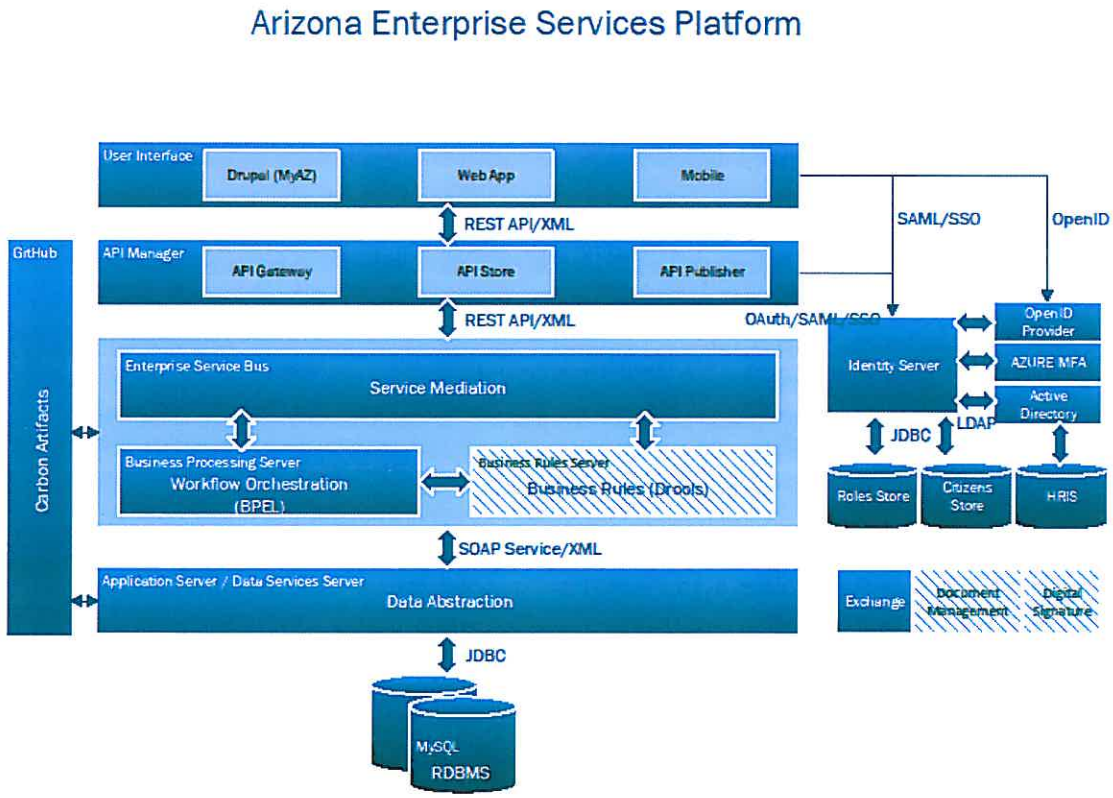
Apache Stratos Core High Availability Implementation (HA) – A service implementation that will ensure a prearranged level of operational performance that will be met during a contractual measurement period. In a production deployment, inclusion of HA features for all Stratos components helps to assure that the PaaS cloud is available to its highest possible level.

QSP Platform Migration (5 APIs) – ADOA-ASET has completed multiple Proof of Concept (POC) projects to create reusable APIs that have been published and consumed by production applications utilizing WSO2 middleware platform technology. One of these efforts was based on WSO2's Quick Start Program (QSP) which yielded a small scale implementation of the core technologies on which ADOA-ASET was able to build and deploy five APIs to support early adopter applications. These APIs will be migrated to the Production AESP environment and shut down in the QSP environment.

In addition to the solution-related items above, the platform will be secure and fault tolerant. The AESP resides within the AWS State infrastructure with business continuity ensured through existing solution architectures and services, along with penetration and vulnerability testing of platform security controls.

B. Existing Technology Environment

ADOA-ASET has already developed some of the basic components of the solution architecture identified in the above section. Utilizing funds allocated to other approved technology projects, ADOA-ASET has completed development of the Apache Stratos platform, MySQL, AS/DSS, ESB, APIM, and IS. In addition, support for user logon and authentication for the AFIS Advantage project is underway and will be launched with the scheduled July 1, 2015 release of the new financial system. Any new components will be built upon the foundation established for the platform based on the diagram below.



C. *Selection Process*

The use of open-source WSO2 and Apache Stratos middleware will provide the necessary scalability for the deployment to meet the enterprise needs of the State, without the expense of proprietary licensing costs. Given the infrastructure that has already been put in place, the AESP platform will leverage existing components and technologies, rather than require all net-new development each time an agency wants to develop a new solution. Resources familiar with these technologies are already in-place and available to continue development of the AESP and related components.

ADOA-ASET began working with WSO2 open source technologies nearly two years ago to investigate the company and the technology's viability and capacity to meet the needs of this centralized services platform. It was determined that WSO2 is uniquely positioned as the provider of an open source, application, integration, data, identity, governance, and analytics Platform as a Service (PaaS) solution. It is a complete, multi-tenant, self-service, metered, middleware cloud for complex, enterprise projects.

IV. Project Approach

A. *Project Schedule**

Project Start Date: 7/1/2015 **Project End Date:** 6/30/2016

B. *Project Milestones*

Major Milestones	Start Date	Finish Date
QSP Platform Migration (5 APIs)	7/1/2015	8/15/2015
Multi-Factor Authentication (MFA) Integration	7/1/2015	9/30/2015
Stratos Core High Availability Implementation	8/1/2015	9/15/2015
Penetration / Vulnerability Testing	1/1/2016	2/1/2016
Migrate / Onboard myDEQ Application	8/1/2015	10/31/2015
Add Business Process Server (BPS) Component	8/1/2015	10/31/2015
Develop / Test Business Rules Server (BRS) Component	11/1/2015	11/15/2015
Add Business Activity Monitor (BAM) Component	7/1/2015	12/15/2015
Onboard PIJ Automation Application	9/1/2015	12/31/2015
Onboard Single Sign On (SSO) Application	1/1/2016	6/30/2016

C. *Project Roles and Responsibilities*

Agency Director: Kevin Donnellan, Acting ADOA Director
Agency CIO/Sponsor: Michael Lettman, Acting State CIO
Co-Project Sponsor: J.R. Sloan, Acting Deputy State CIO
Project Manager: David Nale, Project Manager, ADOA-ASET
Agency ISO: Darrell Davis, Acting CISO, ADOA-ASET
Business Analyst: Rico Cruz, Business Analyst, ADOA-ASET

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

Project Investment Justification.xlsx

VI. Project Approvals

A. *Agency CIO/ISO Review and Initials Required**

Key Management Information	Yes	No	Inits
1. Is this project for a mission-critical application system?	x		
2. Is this project referenced in your agency's Strategic IT Plan?	x		
3. Have you reviewed and is this project in compliance with all applicable Statewide policies and standards for network, security, platform, software/application, and/or data/information located at https://aset.az.gov/resources/psp? If **NO**, explain in detail in section **"VIII. Additional Information"** below.	x		
4. Will any PII, PHI, or other Protected Information as defined in the 8110 Statewide Data Classification Policy located at https://aset.az.gov/resources/psp be transmitted, stored, or processed with this project? If **YES, the Protected Data section under "VII. Security Controls" below will need to be completed.**		x	
5. Will this project migrate, transmit, or store data outside of the agency's in-house environment or the State Data Center? If **YES, the Hosted Data section under "VII. Security Controls" below will need to be completed.**	x		
6. Is this project in compliance with the Arizona Revised Statutes and GRRC rules?	x		
7. Is this project in compliance with the Statewide policy regarding the accessibility to equipment and information technology for citizens with disabilities?	x		

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)	I. PIJ Type - Pre-PIJ Assessment Cost	**N/A**
Total Development Cost	V. PIJ Financials tab	**$584,440**
Total Project Cost	V. PIJ Financials tab	**$3,925,000**
FTE Hours	See Hover text for FTE Hours	**1,664**

C. *Agency Approvals**

Approver	Printed Name	Signature	Email and Phone
Project Manager:	David Nale		david.nale@azdoa.gov 602-542-2411
Agency Information Security Officer:	Darrell Davis (Acting)		darrell.davis@azdoa.gov 602-542-5409
Agency CIO:	Mike Lettman (Acting)		mike.lettman@azdoa.gov 602-542-0030
Project Sponsor:	J.R. Sloan		jr.sloan@azdoa.gov 602-364-4788
Agency Director:	Kevin Donnellan (Acting)		kevin.donnellan@azdoa.gov 602-542-0066

5.15.15

VII. Security Controls

Collaboration with the ADOA-ASET Security, Privacy and Risk (SPR) team may be needed to complete this section, which is only required for those projects that involve data that is Protected or Hosted outside of the Agency or State Data Center. Additional information can be found in the NIST FRAMEWORK section under RESOURCES at https://aset.az.gov/resources/psp or you may wish to contact ASET-SPR directly at secadm@azdoa.gov for assistance.

A. Protected Data

N/A

B. Hosted Data

☐ Check here if the https://aset.az.gov/arizona-baseline-security-controls-excel spreadsheet is attached. Otherwise explain below what information/support is needed to complete the spreadsheet and/or why no sheet is attached:

In conjunction with this project, the Security, Privacy and Risk (SPR) team within ADOA-ASET has implemented a series of initiatives to ensure that all sensitive and confidential data is securely hosted in the cloud environment, in alignment with federal and State guidelines, policies and current best practices.

☒ Check here if a Conceptual Design / Network Diagram is attached. Otherwise explain below what information/support is needed to complete the diagram and/or why no diagram is attached:

See section 3(B) above.

VIII. Additional Information

None

IX. Attachments

The following are examples of supporting documents that should be sent as email attachments when required:

A. Vendor Quotes
B. Arizona Baseline Security Controls spreadsheet
C. Conceptual Design / Network Diagram
D. Other

X. Glossary

Other Links:
ADOA-ASET Website

ADOA-ASET Project Investment Justification Information Templates and Contacts

Email Addresses:
Strategic Oversight

ADOA-ASET_Webmaster@azdoa.gov

ADOA-ASET - Arizona Strategic Enterprise Technology

Project Investment Justification - Risk Matrix

Project ID: To Be Provided by ADOA-ASET **Date Accepted:** To be Provided by ADOA-ASET

Project Information

Agency Name	Project Name	Date Submitted
Arizona Department of Administration (ADOA)	Arizona Enterprise Services Platform (AESP)	05/08/15

Project Questions	Agency Response (Y/N)
Does the project involve customized software not previously implemented by your agency?	y
Does the project involve a customized application not previously developed by your agency?	y
Does the project involve any technology that is new and/or unfamiliar to your agency?	y
Does the project involve multi-agency and/or multiple vendor coordination?	y
Is there any possibility that project implementation costs could reach $1 million or more? (Include professional services, hardware, software, license fees, taxes, shipping, etc.)	y
Will the project require that a Request for Proposal (RFP) be issued?	n
Are there any known schedule or budget constraints?	y
Does this system interface among 2 or more applications?	y
Will the implementation involve major end user view or functionality changes?	y
Will the implementation require any physical infrastructure improvements, e.g., building reconstruction, etc.?	n
Are there other high risk project items not identified? If so, please explain below:	n
Does the project fall into one of the following categories: - hardware technology refresh, e.g., PCs, laptops, radios, peripherals, etc.? - software version refresh, e.g., MS Office 2010 replacing 2007? - enhancements to an existing application, e.g., web app, internal system?	n
Will the technology and all required services be acquired off existing State contract(s)?	y
Does the project have the correct skillset and number of in-house resources assigned to meet the objectives?	y
Will a dedicated Project Manager (PM) be assigned?	y
Will the PM managing the project be credentialed (if costs could reach $1 million or more)?	y
Does your agency have experience with the vendor (if used)?	y
Does the vendor have professional experience with similar projects?	y

Investment Sustainability Questions	Agency Response (Y/N)
Are ongoing/5-year support costs, once the project has been implemented, reflected in the operational costs for the PIJ?	y
Has your agency addressed supporting components to ensure the investment can be sustained, e.g., documentation, application ownership, portability, plans upon contract/support termination?	y
Does the production site have sufficent failover and disaster recovery plans in place to assure your agency will be able to recover from an unplanned incident?	y
Does your agency and/or the proposed vendor have the resources and supporting infrastructure currently in place to sustain the proposed investment?	y

Agency Questions	Agency Response (Y/N)
Are all current agency projects in "Green" status, with no outstanding issues that ADOA-ASET is monitoring?	n
Does your agency currently have any projects that are in "Red" status?	y
Has your agency demonstrated a consistent reporting relationship with ADOA-ASET Oversight, e.g. reports submitted on time and accurate (verified by CIO)?	y
Is this your agency's first PIJ?	n
Has it been more than 2 years since your agency submitted a PIJ?	n
Does your agency have a formal project methodology in place?	y

ADOA-ASET - Arizona Strategic Enterprise Technology
Areas of Impact

Please check which of the following technology areas will be included in the proposed solution - check all that apply:

Application Systems

- [ ] Application Enhancements
- [x] New Application Development
- [ ] Internal Use Web Application
- [ ] az.gov Web Portal
- [ ] Mobile Application Development
- [x] Arizona Enterprise Solution Platform (AESP) based Application

Database Systems

- [ ] Data Warehouse/Mart
- [x] Database Consolidation/Migration/Extract Transform and Load Data
- [x] Database Products and Tools
  - [ ] Oracle
  - [x] MySQL
  - [ ] DB2
  - [ ] MS SQL Server
  - [ ] Other: (Please specify below)

Software

- [ ] COTS Application Acquisition
- [ ] COTS Application Customization
- [ ] Mainframe Systems Software
- [ ] PC/LAN Systems Software
- [x] Open Source
- [ ] Virtualization
- [ ] Other: (Please specify below)

Hardware

- [ ] LAN/WAN Infrastructure
- [ ] PC Purchases, Peripherals
- [ ] Mainframe Infrastructure
- [ ] Tape Libraries/Silos
- [ ] Storage Area Network Devices
- [ ] UPS Devices
- [ ] Public Safety Radios, Systems
- [ ] Other: (Please specify below)

Hosted Solution (Cloud Implementation)

- [ ] State Data Center
- [x] Commercially Hosted
  - [ ] Amazon (AWS) GovCloud
  - [x] AWS (non-government) cloud
  - [ ] Century Link - I/O Data Center
  - [ ] Microsoft Azure
- [ ] Vendor Hosted
- [ ] Other: (Please explain below)

Security

- [ ] Encryption
- [ ] Security Appliances
  - [ ] Firewall
  - [ ] Intrusion Detection System (IDS)
  - [ ] Intrusion Prevention System (IPS)
  - [ ] Other: (Please specify below)
- [ ] SecurityControls/Systems - Other: (Please specify below)
- [ ] Physical Controls (Badging Systems, Iris Scanners, Other: (Please specify below)

Telecommunications

- [ ] Network Communications Infrastructure
- [ ] Telephone Upgrade-Business-Specific
- [ ] Telephony Upgrade-EIC Solution
- [ ] Cabling
- [ ] Trenching
- [ ] Wireless Access Points
- [ ] Videoconferencing
- [ ] Other: (Please specify below)

Enterprise Solutions

- [ ] Business Intelligence System
- [ ] Document Management/Imaging
- [ ] E-Signatures
- [ ] eLicensing
- [ ] Geographic Information Systems
- [ ] Management Systems - Financial, Grants, Asset
- [ ] Other Imaging - Photos, Fingerprints, etc.
- [ ] Disaster Recovery/Business Continuity
- [x] Other: (Please specify below)

This is a centralized platform upon which any number and type of applications and/or services may be built.

Contract Services/Procurement

- [x] Contract Project Management
- [ ] State Contract
- [x] Contractor Support Services
- [ ] Vendor provided
- [x] Install/Configuration Contract Services
- [ ] Procurement (RFP, IFB, DPR, etc.)
- [ ] Other: (Please explain below)

ADOA-ASET - Arizona Strategic Enterprise Technology

Project Investment Justification - Financials

Project ID: To Be Provided by ADOA-ASET **Date Accepted:** To be Provided by ADOA-ASET

Project Information

Agency Name	Project Name	Date Submitted
Arizona Department of Administration (ADOA)	Arizona Enterprise Services Platform (AESP)	05/08/15

PIJ Development & Operational Cost Summary

Description	Type	Year 1	Year 2	Year 3	Year 4	Year 5	Extended Cost
Professional & Outside Services	Development	$572,240.00					$572,240.00
	Operational	$590,560.00					$590,560.00
Hardware	Development						$0.00
	Operational						$0.00
Software	Development						$0.00
	Operational						$0.00
Communications	Development						$0.00
	Operational						$0.00
Facilities	Development						$0.00
	Operational						$0.00
Licensing & Maintenance Fees	Development						$0.00
	Operational						$0.00
Other	Development	$12,200.00					$12,200.00
	Operational	$1,450,000.00	$250,000.00	$250,000.00	$250,000.00	$550,000.00	$2,750,000.00
	Development Cost:	$584,440.00	$0.00	$0.00	$0.00	$0.00	$584,440.00
	Operational Cost:	$2,040,560.00	$250,000.00	$250,000.00	$250,000.00	$550,000.00	$3,340,560.00
	Total Cost:						$3,925,000.00

Project Funding (add sources as appropriate)

Funding Source Category	Fund Name	Development Budget ($)		Operational Budget ($)		Total ($)
		Currently Available	New Request	Currently Available	New Request	
General Funds						$0.00
Federal Funds						$0.00
Other Appropriated Funds	FY16 - Automation Projects Fund	$584,440.00		$2,040,560.00		$2,625,000.00
Other Appropriated Funds	Web Portal Fund (New Budget Request FY17)				$1,300,000.00	$1,300,000.00
Total Funding		$584,440.00	$0.00	$2,040,560.00	$1,300,000.00	$3,925,000.00

ADOA-ASET - Arizona Strategic Enterprise Technology

Project Investment Justification - Itemized List

Project ID: To Be Provided by ADOA-ASET **Date Accepted:** To be Provided by ADOA-ASET

Project Information

Project Name	Agency Name	Date Submitted
Arizona Enterprise Services Platform (AESP)	Arizona Department of Administration (ADOA)	05/08/15

Project Cost - Itemized

Item	Description	Category	Development or Operational	Qty or Hours	Unit Cost	Tax (if app)	Extended Cost
1	Professional Services provided by vendor @ $26K/mo (1 resource) Core Platform Development	Prof & Outside Services	Development	1	$312,000.00		$312,000.00
2	ASET Dev/Ops Team split (Platform functionality development) (Manager, QA, DB, Java Developer x 2)	Prof & Outside Services	Development	1	$260,240.00		$260,240.00
7	Development Contingency	Other	Development	1	$12,200.00		$12,200.00
3	ASET Dev/Ops Team split (Ongoing operational support) (Manager, QA, DB, Java Developer x 2)	Prof & Outside Services	Operational	1	$590,560.00		$590,560.00
5	Cloud infrastructure subscription (Yearly AWS Fee $250,000) Years 1	Other	Operational	1	$250,000.00		$250,000.00
4	Operational Support (years 1-4); maintenance & support; software/hardware licensing support; operational support from vendors. WSO2 subject matter experts.	Other	Operational	4	$300,000.00		$1,200,000.00
6	Cloud infrastructure subscription (Yearly AWS Fee $250,000) Years 2-5 (New budget request)	Other	Operational	4	$250,000.00		$1,000,000.00
	Operational Support (year 5); maintenance & support; software/hardware licensing support; operational support from vendors. WSO2 subject matter experts. (New Budget Request)	Other	Operational	1	$300,000.00		$300,000.00
8		[--Select--]	[--Select--]				$0.00
9		[--Select--]	[--Select--]				$0.00
10		[--Select--]	[--Select--]				$0.00
11		[--Select--]	[--Select--]				$0.00
12		[--Select--]	[--Select--]				$0.00
13		[--Select--]	[--Select--]				$0.00
14		[--Select--]	[--Select--]				$0.00

Total of Development Cost	$584,440.00
Total of Operational Cost	$3,340,560.00
Total Itemization of Costs:	$3,925,000.00