pGc Paul Garstki Consulting

INDEPENDENT REVIEW

OF A PROPOSED

EPROCUREMENT SOLUTION AND IMPLEMENTATION SERVICES

For the
State of Vermont
Agency of Digital Services (ADS)
And
Office of Purchasing & Contracting (OPC)

Submitted to the
State of Vermont, Office of the CIO
by:

Paul E. Garstki, JD, Consultant
d/b/a/ Paul Garstki Consulting
344 Laird Pond Rd.
Plainfield, VT 05667
paulg.consulting@gmail.com

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1. EXECUTIVE SUMMARY

1.1 COST SUMMARY

IT Activity Lifecycle:	**10**
Total Lifecycle Costs:	**$ 13,125,594.35**
Total Implementation Costs:	**$ 7,743,594.35**
New Annual Operating Costs:	**$ 598,000.00**
Current Annual Operating Costs	**$ 3,261,046.00**
Difference Between Current and New Operating Costs:	**$ 2,663,046.00)**
Funding Source(s) and Percentage Breakdown if Multiple Sources:	**State**

1.2 DISPOSITION OF INDEPENDENT REVIEW DELIVERABLES

A NOTE TO THE READER

The eProcurement project, with its origins at least 4 years ago, is an extensive and expansive project, intended to touch all corners of State government and some entities beyond. For the past 2 years especially, State project team members with consultative assistance have engaged with prospective vendors, exchanging requirements, discussing best approaches, suggesting changes, negotiating implementation designs, evaluating business needs, negotiating contract language and pricing, and evaluating the enterprise architecture of the proposed solution. The resulting documentation is extensive, comprehensive, sometimes necessarily redundant, and resists condensing, especially in technology architecture and implementation planning areas.

In the present review, we have attempted to focus on that information necessary to the review requirements, to keep the resulting report wieldy. The reader should not suppose that this is a complete description in every detail of all components for this project. For that, the best initial source is the proposal by the selected vendor, in its post-Best and Final Offer (BAFO) form, and ultimately the resulting contracts.

INTRODUCTION

The State intends the acquisition of a comprehensive eProcurement system, integrating procurement operations and processes from the identification of a need to the payment of an invoice, and covering all intermediate steps in the process. The system is to be deployed uniformly across State government and available to political subdivisions and educational institutions as allowed by statute. It will conform to State Enterprise Architecture standards and preferences, assure secure data and be compliant to privacy standards and laws. It will include a platform for the State to analyze spending practices. The system will integrate with the State's financial system (VISION) as well as other necessary procurement data systems (e.g., VTRANs STARS).

Deliverable	Highlights from the Review *Include explanations of any significant concerns*
Acquisition Cost Assessment	Total Acquisition Costs (implementation) are **$7,743,594**. $595,000 covers the 1st year of subscription cost for software services from the solution provider. This amount will continue as the annual Operations & Maintenance cost for the lifecycle of the project. Approximately 43% of the remaining cost ($3,051,543.00) covers implementation services, and approximately 57% ($4,097,051.35) covers personnel (mostly vendor personnel) for implementation. When compared to project costs in two other states selected for recent implementations and projects similar to Vermont's, the Vermont cost is moderate for the 10 year projected lifecycle, largely due to implementation costs, and lowest among the 3 for ongoing annual costs. **In all, we find the cost to the State fair and reasonable for the scope and complexity of the project. We think the very careful preparation of the State project team and early definition of business needs contributed to the State's good result in these negotiations.**
Technology Architecture Review	The proposed project implements a comprehensive eProcurement system available to all State Agencies and Departments, as well as (per statute) political subdivisions and institutions of higher education.[1] The system is offered to the State by the implementation and system vendors as a pure Software as a Service solution. Aside from web access devices (desktop web browser, mobile app), no hardware devices in this solution are hosted, maintained, or supported by the State; and no solution software is hosted in State data centers or on State servers. As a SaaS solution, the proposed project is highly compatible with State software and hosting preferences for data-based systems. Although it is anticipated that the new system will displace some existing State technological systems — which may include, for example, standalone databases, Excel spreadsheets, Word documents and templates — there is no comprehensive inventory of systems to be replaced,

[1] 29 V.S.A. 302(a)

	nor is such an inventory planned. We do not view this as a significant risk: Most — ideally all — such systems will be obviated by the new system, although some may be kept around for some time as sources of historical data. There are some minor risks for data movement in the network, which will be easily mitigated by preferring best practices throughout implementation. Some recent instability in the State's internal network establishes a risk which the State recognizes and will work to mitigate going forward. The system is consistent with the State IT Strategic plan. In all, the system is highly secure, sustainable, and recoverable. There are some minor risks identified in the security domain which will be resolved by requiring compliant actions on the part of the vendor. The service level agreements are adequate and proper.
Implementation Plan Assessment	We found the selection and engagement of the project team to be extraordinarily broad and deep, as well as consistent throughout the project process from development of business needs informing the RFP, through the evaluation, scoring and selection process, through to the current stage of contract negotiation and further project refinement. In our assessment, the very broad range of procurement interests across State government has been well represented in this project. We interviewed in particular the Agency Leads on this issue, since they have a deep familiarity with the procurement needs of Agencies and Departments (for example, Federal funding sources may have very particular and unique compliance requirements, and procurement in Human Services may have to focus on very different processes from those in Transportation). We found a very high level of enthusiasm, a sense of being heard, and sense that they will continue to be heard throughout the implementation process. The implementation plan is comprehensive and extensive, and has been well-vetted by the State, adjusting where necessary to meet State needs and requirements. The vendor's experience is broad and deep. A great deal of detail has been put forth to apprise the State of the vendor's implementation approach and plan, and it seems well-formed to meet State objectives. Deliverables are well-defined for this stage of the process, and the means for defining further deliverables is described in detail. At every point, the plan puts the State in the proper role of defining needs, receiving and assessing deliverables, and approving deliverables when they have met tested objectives.
Cost Analysis and Model for Benefit Analysis	Tangible benefits: • **Cost savings as a proportion of total procurement spend**: **Potentially $4.2 million annually** • ***Possible* cost savings over lifecycle, compared to current procurement costs: $ 19,484,866 ($1,948,488 annualized)** Intangible benefits are multiple, relating closely to the original objectives of the project, and listed in tabular form in this report. There is some question for us as to whether the intangible benefits can be uniformly and quantitatively measured, and we identify this as a risk. However, and we emphasize this point, *whether or not success is able to be quantified*, it seems likely to occur, and should be apparent anecdotally. The question is primarily one of *demonstrating* success through quantitative measures where possible.

	And **we remind the reader that the tangible benefits, especially possible savings in total procurement spend, are both likely and quantifiable.** **We have no doubt that the benefits of this project far outweigh the costs.**
Impact Analysis on Net Operating Costs	Our analysis shows that, after a cost-intensive period of implementation (approximately $7.7 million), annual Operations & Maintenance (O&M) costs will be $595,000, well below the estimated cost of current procurement operations across State government. • Cumulative Cost Savings over 10 years of project compared to current costs = $19,484,866.. • Breakeven point is FY 2022 Graphic representations are given in this section of the report

1.3 IDENTIFIED HIGH IMPACT &/OR HIGH LIKELIHOOD OF OCCURRENCE RISKS

NOTE: Throughout the narrative text of this document, **Risks and Issues are identified by bold red text**, and an accompanying tag (**_RISK_ID# _0_**) provides the Risk or Issue ID to reference the risk, response, and reference in the Risk Register.

The following table lists the risks identified as having high impact and/or high likelihood (probability) of occurrence.

Please see the **Risk & Issues Register, in Section 10**, for details.

Identified High Impact &/or High Likelihood of Occurrence Risks in this project:

Risk Description	RATING IMPACT/ PROB	State's Planned Risk Response	Reviewer's Assessment of Planned Response
Project has defined several quantitative metrics to measure eventual project benefit and/or success, but baseline data on some of these metrics have not been collected or compiled. If not established before implementation, baseline data could be lost if contained in retired systems.	**49** **7/7**	There are some data points regarding procurement metrics that BGS OPC has that can be used as baseline data that will be metrics to measure. Part of the goals of implementing this system is so that there are more metrics to be used in the future regarding Procurement. BGS OPC has a fair amount of metrics, but it is only specific to the contracts that go through their office and doesn't represent the State as a whole.	**Agreed**
Internal State network connectivity problems are frequent and "pervasive," for reasons that are not completely defined.	**35** **7/5**	The State is addressing this issue by a separate project of network redesign and upgrade which is now underway and ongoing.	**Agreed**
A variety of data movement methods are employed throughout State government. Some of these are deprecated methods, such as batch, point-to-point, hard-coded IP addresses in configuration files.	**35** **7/5**	Throughout development, always prefer best practices, such as RESTful etc., and when not practical in the short term, make a clear path for long term. **(agree with)**	**Agree**

Some very small or geographically isolated vendors may face technological challenges (broadband / cell availability, web browsing device) discouraging or preventing them from using the system.	**21** **7/3**	Explicitly plan and build-in small/challenged vendor onboarding **(agree with)**	**Agree**
According to NASPO research, "broad adoption is the only driver for achieving the substantial benefits of an eProcurement system and business practice." The State has focused considerable effort on ensuring broad adoption; but falling short of this goal will be a risk until the target adoption is completed.	**10** **10/1**	There will be Policy put in place, likely updates to Bulletin 3.5, as well as notification from the Agency of Administration that makes it clear the eProcurement system will be the system of record and must be used by all State Agencies and Departments.	**Agree**

1.4 OTHER KEY ISSUES

NONE

1.5 RECOMMENDATION

We recommend that the State continue to implement this project, mitigating risks as agreed and documented in the IR Risk Register.

1.6 INDEPENDENT REVIEWER CERTIFICATION

I certify that this Independent Review Report is an independent and unbiased assessment of the proposed solution's acquisition costs, technical architecture, implementation plan, cost-benefit analysis, and impact on net operating costs, based on the information made available to me by the State.

E-SIGNED by Paul Garstki
on 2019-09-23 12:28:58 GMT

_____ _____

Signature **Date**

1.7 REPORT ACCEPTANCE

The electronic signature below represent the acceptance of this document as the final completed Independent Review Report.

E-SIGNED by John Quinn
on 2019-09-23 14:27:08 GMT

_____ _____

State of Vermont Chief Information Officer **Date**

2. SCOPE OF THIS INDEPENDENT REVIEW

2.1 IN-SCOPE

The scope of this document is fulfilling the requirements of Vermont Statute, Title 3, Chapter 45, §2222(g):

The Secretary of Administration shall obtain independent expert review of any recommendation for any information technology initiated after July 1, 1996, as information technology activity is defined by subdivision (a)(10), when its total cost is $1,000,000 or greater or when required by the State Chief Information Officer.

The independent review report includes:

- An acquisition cost assessment
- A technology architecture review
- An implementation plan assessment (which includes a Risk Analysis)
- A cost analysis and model for benefit analysis; and
- An impact analysis on net operating costs for the Agency carrying out the activity

2.2 OUT-OF-SCOPE

- A separate deliverable contracted as part of this Independent Review may be procurement negotiation advisory services, but documentation related to those services are not part of this report.
- Proposals and vendors other than the bidder selected as first choice through the proposed project's procurement process were not evaluated in this **Review.**

3. SOURCES OF INFORMATION

3.1 INDEPENDENT REVIEW PARTICIPANTS

Acronyms	
• AOA – Agency of Administration • BGS – Department of Buildings and General Services • OPC – Office of Procurement and Contracting • ADS – Agency of Digital Services • AHS – Agency of Human Services • ANR – Agency of Natural Resources • AOT – Agency of Transportation	• IT – Information Technology • EA – Enterprise Architecture • CISO – Chief Information Security Officer (Office of the) • NASPO – National Association of State Procurement Officers

Name	First or Primary Interview Date	Employer and Title	Participation Topic(s)
Brad Ferland	May 14, 2019	VT AOA Deputy Sec. of Administration.	Project Sponsorship
Chris Cole	May 14, 2019	VT BGS Commissioner	Project Sponsorship
Deborah Damore	April 25, 2019	OPC Director	Business
Darwin Thompson	May 9, 2019	ADS IT Lead for AOA	IT/EA
Andrew Laing	May 9, 2019	ADS Chief Data Officer	Data
John Hunt	May 9, 2019	ADS IT Enterprise Architect III	IT/EA
Scott Carbee	May 24, 2019	ADS CISO Security Analyst	Security/Privacy
Trudy Marineau	May 9, 2019	ADS IT Manager – ERP Technical Services development group	IT
Morgan Amell	Continuing	ADS IT Portfolio Manager	Single Point of Contact/Coordination
Donna Amiot	May 21, 2019	ADS Project Manager V	Project Management
Bob Sievert	May 31, 2019	NASPO Consultant	Other States' experiences
Trevor Lewis	May 21, 2019	AOT Assistant Chief of Contract Administration	Agency Lead
Diane Nealy	May 21, 2019	AHS Administrative Services Director	Agency Lead
Brenda Berry	May 21, 2019	ANR Assistant Director of Finance and Administration	Agency Lead
Shawn Benham	May 9, 2019	AOA Agency Financial Analyst	Financials
Andrew Cochran	June 18, 2019	Ohio Department of Administrative Services, State eProcurement Manager	Ohio costs, experiences
Pat Bacon, CPPB	June 28, 2019	State of Missouri Office of Administration, Purchasing Program Review Coordinator	Missouri costs, experiences

3.2 INDEPENDENT REVIEW DOCUMENTATION

The following documents were used in the process and preparation of this Independent Review

Document	Source	Date
Proposal to serve the State of Vermont	KPMG, LLP	22-Dec-17
The Value of eProcurement/ERP Solutions. Case Studies	NASPO	2016
IT Activity Business Case & Cost Analysis (IT ABC Form)	VT ADS	12/27/2016
SEALED BID INFORMATION TECHNOLOGY REQUEST FOR PROPOSALFOR eProcurement Solution and Implementation Services	VT BGS/OPC	9/20/2017
Agency of Administration Enterprise E-Procurement Solution Project Charter	VT ADS	1/25/2019
AOA Enterprise eProcurement Solution Organization Chart	VT AOA	
Architecture Vision Enterprise E-Procurement Solution (ERP Phase III)	VT OPC / Dept. of Finance / ADS	
Architecture Assessment Workbook_EPROC	VT ADS	
Integration Points Ivalua / VISION	VT ADS EA	6/12/2019
EPROC Reference Architecture Diagrams	VT ADS EA	
BAFO Response Review Summary of Findings	CIVIC Initiatives	8/27/2018
Assorted BAFO documentation and communication	VT OPC	10/19/2018
State of Vermont eProcurement RFP KPMG/Ivalua Final Terms	KPMG, LLP	3/28/2019

2015 VIRGINIA ACTS OF ASSEMBLY CHAPTER 665	Commonwealth of Virginia	3/26/2015
eVA Savings and Value	Commonwealth of Virginia	8/26/2016

4. PROJECT INFORMATION

4.1 HISTORICAL BACKGROUND

The earliest Vermont eProcurement project efforts began in 2015, when the State worked with outside consultants to analyze and document existing procurement processes. The information gathered was used in 2017 to begin in earnest the Request for Proposals (RFP) development process. Again with the assistance of a third-party consultant, Civic Initiatives, LLP, (CIVIC) the State Office of Purchasing and Contracting (OPC) of the Agency of Administration (AOA) Department of Buildings and General Services (BGS) began close work with the Agency of Digital Services (ADS) and the Attorney General's Office (AGO) to create a comprehensive RFP for the acquisition of an eProcurement system.

The RFP was issued on September 20, 2017, with a formal questions and answers (Q&A) period and 3 addenda over the following 3 months. The deadline for bidders' proposals was January 4, 2018. Three bid proposals were received, from KPMG LLP, Perfect Commerce – A Proactis Company, and Periscope Holdings Inc. Each bid was reviewed by the Bid Administrator to verify compliance with all bid requirements.

A project document repository (SharePoint site) was created for the bid evaluation process. The project team comprised a core team of ADS Enterprise Architect, ADS Technical Lead, OPC Business Lead, and AGO Legal Lead. An evaluation team of 9 was formed, including members from OPC and ADS, a member from Finance and Management (F&M), and "Agency Leads" from the Agency of Human Services (AHS), Agency of Education (AOE), Agency of Transportation (AOT), and Agency of Natural Resources (ANR). Subject Matter Experts (SME) for the project team included persons from AHS, ADS, OPC, Agency of Agriculture (AGR), Department of Public Safety (DPS), and Military (MIL).

We find the selection and engagement of the team to be extraordinarily broad and deep, as well as consistent throughout the project process from development of business needs informing the RFP, through the evaluation, scoring and selection process, through to the current stage of contract negotiation and further project refinement. In our assessment, the very broad range of procurement interests across State government has been well represented in this project. We interviewed in particular the Agency Leads on this issue, since they have a deep familiarity with the procurement needs of Agencies and Departments (for example, Federal funding sources may have very particular and unique compliance requirements, and procurement in Human Services may have to focus on very different processes from those in Transportation). We found a very high level of enthusiasm, a sense of being heard, and sense that they will continue to be heard throughout the implementation process.

A very comprehensive scoring matrix was developed, trackable to the parameters established in the RFP's Requirements Traceability Matrix (RTM) and was used rigorously and exclusively by scorers. A comprehensive process of evaluations, consensus establishment, questions, clarifications, and walkthroughs commenced. Working with CIVIC, the team formulated detailed vendor-specific questions requesting additional information about the bid proposals as a precursor to bidder demonstrations.

These were transmitted to the vendors along with invitations and instructions for demonstrations. The three separate two-day vendor demonstrations were hosted in April and May of 2018.

Following demonstrations, a process of consensus scoring took place, appropriately weighing aspects of the information gained, and two vendors were selected and Best and Final Offer (BAFO) invitations were sent to two vendors. Following the BAFO responses, a period of BAFO negotiations with each vendor ensued.

The State selected KPMG, LLP's (KPMG) proposal for the eProcurement project. KPMG proposed the implementation of a solution platform by Ivalua. Following further discussion, the State has made the decision to negotiate this project under two separate contracts: one with KPMG for implementation, including all associated services (such as design, training, vendor-side project management, etc.); and one with Ivalua for the Software as a Service (SaaS) eProcurement operation and maintenance throughout the lifecycle of the project.

4.2 PROJECT GOAL

The State of Vermont contemplates the purchase of a comprehensive eProcurement system, to replace the current methods of procurement which exist across State government Agencies and other entities. Although they may use modern productivity tools such as spreadsheets, email, and electronic signature systems, these currently existing methods are largely manual and referred to as "paper-based" (since they use these tools in a non-interconnected way to create and track requests for proposals, purchase orders, contract drafts and final contracts, etc. This fact makes it difficult for the State to accurately and consistently analyze spending, efficiently maintain and control the language of contracts and agreements, understand and find efficiencies in purchasing, encourage competition and participation among vendors, and to realize resulting cost savings. (Financial information and related data after purchase, and/or after contract execution, *is* contained and managed across government in the State's VISION financial system.)

An Electronic Procurement (eProcurement) system is the government-to-business purchase of supplies, work, and services through the Internet. Although eProcurement systems come in many forms, and may address any portion of the procurement process, the State desires a so-called "[from]Need-to-pay" system, facilitating the process from the identification of a need (a desire to acquire a service, product, commodity, etc.) to the approval of payment to the vendor, with all the steps and variety of steps in-between, such as identification and pricing of products through vendor catalogs, Requests for Information or Requests for Proposals, Contracts, Statements of Work, Purchase Orders, Invoices, Approvals of all the above, and much more. The eProcurement system also maintains and tracks data about all these activities and vendors, providing a platform for the State to analyze its spending practices and trends.

The eProcurement system is intended to drive greater process efficiencies in procurement, contracting and purchasing. According to the Project Charter, it is meant to

- Eliminate redundant software applications
- Increase Competition
- Increase participation by traditionally disadvantaged businesses
- Establish consistent procurement practices across all Agencies
- Gain greater control over maverick spend
- Increase use of Statewide Contracts
- Capture state spend in a manner that allows strategic spend analytics to leverage in strategic sourcing and more effective State contracts
- Integrate and interface with the current State financial management system (VISION), related websites and other systems/applications (e.g., VTRANS' STARS financial management system)
- Reduce manual, paper-based processes and process cycle times
- Improve Agency and Department/Vendor interactions

According to The National Association of State Procurement Officers (NASPO) most recent data collection of best practices, the Survey of State Procurement Practices,[2] of the 47 responding states, 36 states use an eProcurement system. (Numbers of eProcurement systems have increased since that survey.) Of those jurisdictions that have an eProcurement system, 22 are integrated with the state financial system.

As a side note by this reviewer: The State intends integration with the VISION financial system. Moreover, the State has been charting and building a strategic and comprehensive path for Enterprise Resource Planning (ERP), including Finance & Management planning, human capital systems, eProcurement, and Grants Management. The selected solution seems a good fit in this enterprise, and project principals have pointed this out. We note that, although Grants Management is not part of this project explicitly, many of the scorers and project participants with grants management experience have noted that the selected solution may well be capable of this. We think it is worth keeping in consideration.

[2] NASPO, The Value of eProcurement/ERP Solutions. Case Studies, pg. 2

4.3 PROJECT SCOPE

IN-SCOPE

The following In-Scope definitions are derived from the Project Charter:[3]

The work is organized into the following sections:

- Functional Requirements
- Non-Functional Requirements
- Solution Implementation Requirements

The functionality the State envisions in a Solution would comprise full purchasing, sourcing, contracting and related processes with full functioning integration to VISION (real-time and/or batch) at designated strategic points necessary to meet all State budget and financial management needs. The States' associated Functional Requirements are organized and presented below by the following procurement Workstreams.

- Need to Pay
- Catalog Capability
- Vendor Enablement/Management
- Sourcing/Bid Management
- Contract Management
- Spend/Data Analytics-Reporting

1. THE STATES' NON-FUNCTIONAL REQUIREMENTS:

- User Experience
- Solution Access and Supported Browsers
- Technical Requirements
- American with Disabilities Act
- Web Services and Services Oriented Architecture (SOA)
- Solution Environments
- User Accounts and Administration
- Audit Trail and History
- Interface and Integration
- Existing Systems and Data Conversions
- Office Automation Integration
- Mobile Device Support
- Mobile Applications

[3] eProcurement Project Charter, p. 8

- Disaster Recovery Plan

2. THE STATES' INTERFACES, INTEGRATION AND MOBILE APPLICATION SUPPORT POINTS:

- Full functioning integration to VISION V9.2 Financial System to facilitate financial management and payment processes.
- STARS Financial System Interface to facilitate financial management and invoice matching processes. Transactions to be integrated: Requisitions, Purchase Orders / Change Orders, Receipts, Invoices, Vouchers and Contracts/Amendments.
- Office Automation Integration
- Mobile Device Support
- Mobile Applications capable

3. EXISTING SYSTEMS REPLACEMENTS AND ASSOCIATED DATA CONVERSIONS:

- AASHTOWare (TBD)
- Bidx (TBD)
- Vermont Bid System (EBB)
- OneSpan Sign
- VISION Contracts
- BGS Vertical Construction Bid Posting Site (TBD)

4. SOLUTION IMPLEMENTATION:

- Project Implementation Schedule
- Project Initiation (Business Process Re-engineering analysis, Fit-Gap analysis, Solution Architecture structure, implementation strategies, interface & integration specifications, etc.)
- Project Management
- Contractor Project Manager (Project Management Plan, Communication Plan, Deliverable Approval Matrix, Kickoff Meeting, Knowledge Transfer Plan, Discover Calendar & Agendas, Requirement Validation Sessions, Testing Plans, Readiness Assessments, Contingency Plans)
- Project Staffing
- State Project Support
- Testing
- Organizational Change Management
- Training
- On-Going Support Services

OUT-OF-SCOPE

- Grants Management

4.3.1 MAJOR DELIVERABLES

These are the major deliverables as listed by the implementation vendor:[4] To understand these deliverables in context, please see **7.3** "**Milestones and Deliverables proposed by the vendor",** *below.*

Project Management Plan
Integrated Project Plan
Target Operating Model
Environment strategy
Data Migration Strategy
Test Strategy
Integration Strategy
Reporting Strategy
Configuration workbooks/Documentation
Interface functional specification
Business process models
Business and technical design documents
Configuration Management Plan
Data Migration Plan
Deployment plan
Test plan
Test cases and scripts
Test results

4.4 PROJECT PHASES, MILESTONES, AND SCHEDULE

STATE-DEFINED MILESTONES

The following list of contract milestones is derived from the Project Charter, projecting dates from the completion of this review.[5]

[4] KMPG LLC, Proposal to serve the State of Vermont, Appendix F

[5] eProcurement Project Charter, pg. 10

Project Milestone	Date
Finalist Demonstrations (On-Site)	April 2018
Selection Notification	March 2019
Independent Review Completed	July 2019
Contract Signed	Above line + 1 month
Project Schedule Workplan	Above line + 1 month
Project Kickoff	Same as above line

VENDOR MILESTONES

A list of vendor milestones may be found in **7.3.7 Implementation,** *below*.

5. ACQUISITION COST ASSESSMENT

Acquisition Costs	Cost	Comments
Hardware Costs	**$0.00**	No cost to State for hardware
Software Costs	**$595,000.00**	O&M Subscription Cost (1st year is concurrent with implementation)
Implementation Services	**$3,051,543.00**	provided by implementation vendor
State Personnel	**$407,825.35**	ADS, PM, Limited Service OCM
Professional Services (e.g. Project Management, Technical, Training, etc.)	**$3,689,226.00**	provided by implementation vendor & IR consultant
Total Acquisition Costs	**$7,743,594.35**	

The table above shows combined costs as they appear in **Attachment 3, Cost Spreadsheet**. The State is negotiating two vendor contracts, one with KPMG LLP (implementation vendor) and one with Ivalua (solution vendor) for software services – subscription, maintenance, and support. The O&M Subscription cost (Software Costs) represent an all-inclusive cost for the solution, including all user licenses etc.; at the time of review, no additional costs are anticipated for the solution vendor.

5.1 COST VALIDATION:

Implementation vendor and solution subscription costs derived from final post-BAFO negotiation cost proposal from the implementation vendor. Figures and details in the IR cost spreadsheet (Attachment 3) were shared with the project financial analyst, discussed, and confirmed for current accuracy. Internal costs for State Personnel reflect actuals as reported at the time of this review as well as intended costs not yet finalized for the Organization Change Manager. Professional Services costs are as provided in vendor's final offer and in IR consultant retainer contract & SOW.

5.2 COST COMPARISON:

How do the above Acquisition Costs compare with others who have purchased similar solutions (i.e., is the State paying more, less or about the same)?

As mentioned in the project introduction, NASPO's most recent data collection of best practices. the "Survey of State Procurement Practices", reported that of the 47 responding states, 36 states use an eProcurement system. (Numbers of eProcurement systems have increased since that survey.) Of those jurisdictions that have an eProcurement system, 22 are integrated with the state financial system.[6]

States implement eProcurement in a variety of ways, depending on the range of procurement practices they wish to facilitate and the expected deployment scope (i.e., all government Agencies, only certain ones). We contacted three states' Procurement Officers requesting information about their recent eProcurement deployment implementation costs, ongoing costs, and experiences with vendors. We received two detailed and useful replies in this regard, from the States of Missouri and Ohio. Ohio uses Ivalua, the solution vendor selected by Vermont. Missouri uses a different vendor, Perfect Commerce (who also submitted a competitive bid in the Vermont RFP process.)

The table on the next page below shows the various project cost as they were reported to us. In this table, all implementation costs are included in the first year (Y1) column. (Although Ohio reported a 12 year project cycle, we only use the first 10 years in this table; the remaining 2 years have identical costs to year 10.)

We did not use any multiplier or divisor to normalize the costs on the basis of population, State employee counts, etc. We note for the reader that these states vary in the way implementation, including business process analysis, is staffed. Some states use third-party or in-state resources to a greater or lesser extent; we did not adjust for that.

The first chart shows the 10 year project totals for all 3 states. The range is $9,839,671 to $20,639,648, with Vermont at median. This apparently reflects the apparent absence of implementation costs for the Perfect Commerce Solution. The Vermont proposal evaluation team did note a lower cost for Perfect Commerce but felt that on balance the advantages provided by KPMG/Ivalua for Vermont's needs provided a better solution. We did not evaluate other proposals, but we did review the Vermont project team's summary and assessment, and we find it compelling. We do not think Vermont's total project costs are out of line with these other, recent, deployments. We also note that, should Vermont's employment of the selected solution run well beyond the initially projected lifecycle, the implementation costs would eventually be absorbed and overrun.

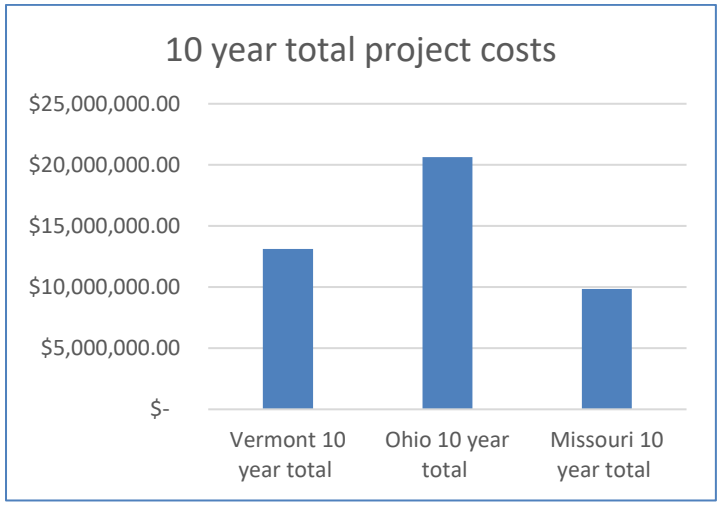
The second chart shows the Average Annual Operational Costs for all 3 States. Here, Vermont has the lowest annual cost. The highest cost is for Ohio's system, also Ivalua. We are guessing here that this comparison shows the result of a higher per-user licensing cost, and we note approvingly that the

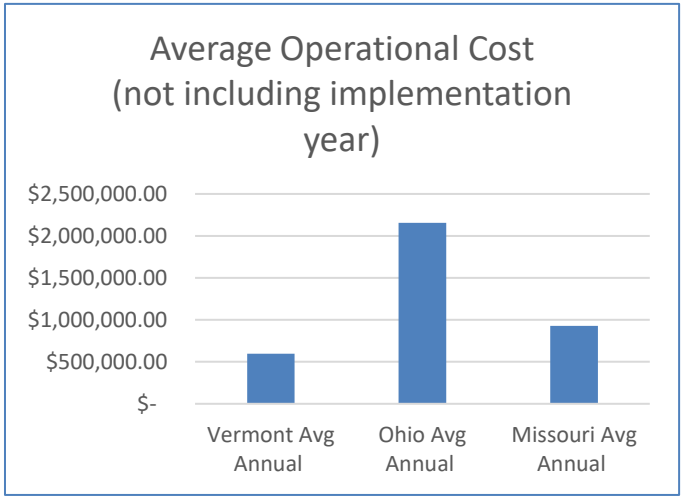
[6] NASPO, The Value of eProcurement/ERP Solutions. Case Studies

Vermont project team adjusted the originally proposed licensing agreement to better fit Vermont's needs and budget.

Finally, we note here that some states fund eProcurement systems wholly or partially through fee structures. Vermont has not chosen this approach.

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Total
Vermont	$7,335,769.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00	**$13,125,594.35**
Ohio	$ 1,223,834.00	$ 1,879,770.00	$,037,974.00	$ 2,214,010.00	$ 2,214,010.00	$ 2,214,010.00	$ 2,214,010.00	$ 2,214,010.00	$ 2,214,010.00	$ 2,214,010.00	**$ 20,639,648.00**
Missouri	$ 1,481,338.00	$ 892,400.00	$ 892,400.00	$ 892,400.00	$ 892,400.00	$ 937,020.00	$ 937,020.00	$ 965,130.00	$ 965,130.00	$ 984,433.00	**$ 9,839,671.00**





5.3 COST ASSESSMENT:

Are the Acquisition Costs valid and appropriate in your professional opinion? List any concerns or issues with the costs.

We have no concerns or issues with the costs. Looking at other eProcurement deployments nationally, the Vermont solution seems reasonably and appropriately priced. The implementation vendor KPMG LLP has broken out costs for all components of the implementation process, and these costs seem reasonably in line with industry norms. The solution vendor Ivalua has offered a cost which is all-inclusive and meets the State's requirements both functional and non-functional while providing a basis for significant cost benefits compared to current procurement and spend practices in Vermont.

Additional Comments on Acquisition Costs:

> **The original proposal (first bid, before BAFO negotiations) from KPMG LLP was $30.4 million for the 10 year lifecycle. The original proposal from Perfect Commerce – a Proactis Company was $4.9 million. The State evaluation team judged the KPMG proposal to be superior in light of the specific needs of the State; in the process of BAFO negotiations with KPMG, the State team focused entirely on stripping away unneeded costs while retaining needed functionality. The knowledge and experience of KPMG was judged by the State to be helpful in these negotiations. By the conclusion of the negotiations – which included significantly reducing vendor personnel overhead while increasing licensing to meet State needs – the KPMG LLP proposal was reduced to $12,750,000.**
>
> **We think the very careful preparation of the State project team and early definition of business needs contributed to the State's good result in these negotiations.**

6. TECHNOLOGY ARCHITECTURE REVIEW

The proposed project implements a comprehensive eProcurement system available to all State Agencies and Departments, as well as (per statute) political subdivisions and institutions of higher education.[7] The system is offered to the State by the implementation and system vendors as a pure Software as a Service solution. Aside from web access devices (desktop web browser, mobile app), no hardware devices in this solution are hosted, maintained, or supported by the State; and no solution software is hosted in State data centers or on State servers. As a SaaS solution, the proposed project is highly compatible with State software and hosting preferences for data-based systems.

The selected proposal was offered by **KPMG, LLP** (referred to herein to as the "**implementation vendor**") and includes the SaaS eProcurement solution offered by **Ivalua** (referred to herein as the "**solution vendor**"). This section on technology describes primarily the SaaS solution offered by the solution vendor; however, the implementation vendor will be the primary responsible party for coordinating and managing the planning, configuration, testing, and staging of the solution. Once implementation is judged by the State to be complete, the State anticipates a continuing Operations and Maintenance (O&M) contract (for the present project) with only the solution vendor.

The solution does not require maintenance by State personnel, and support services are built into the proposal (it is envisioned that the State would provide "tier 1" help desk support; i.e., answering straightforward questions from users regarding normal operations, login issues, procedural steps, etc.). - The Contractor will provide an on-site Help Desk Support presence for 6 months following project implementation end date.

The solution is modular in form, comprising the following modules:

- Supplier Repository
- Registration and Data Management
- Supplier Information Management
- Performance Evaluation
- Supplier Improvement Plans
- Sourcing projects
- RFx (Request For *x* – i.e., *x* may be *Proposals*, *Information*, *Quote*, or *Comments*)
- Auctions
- Bill of Materials
- Procurement project management
- Contract Authoring
- Contract Lifecycle
- Contract Repository
- Purchase Requisitions

[7] 29 V.S.A. 302(a)

- Purchase Orders
- Goods Receipts
- Invoicing
- Analytics & Dashboard
- Items and Catalogs
- Services Procurement

This project and solution is viewed by the State as part of the ongoing endeavor to establish a comprehensive Enterprise Resource Planning (ERP) system. The eProcurement system will interface and integrate to and from the State's VISION PeopleSoft Financial system. The State's intention is to use real time transactional services to integrate transactions as available, otherwise to establish batch interface processing. Design sessions will solidify the approach. The proposed project is a comprehensive "procure-to-pay" system, meaning that it will encompass all the State's processes from the beginning of the procurement process (Requests for Proposals, Purchase Orders, etc.) through to Contracting and Invoicing. The VISION financial system will continue to be the system of record for financial data; the proposed system would be the single and official repository for all procurement transactions and associated data, including Contracts.

Although it is anticipated that the new system will displace some existing State technological systems — which may include, for example, standalone databases, Excel spreadsheets, Word documents and templates — there is no comprehensive inventory of systems to be replaced, nor is such an inventory planned. We do not view this as a significant risk: Most — ideally all — such systems will be obviated by the new system, although some may be kept around for some time as sources of historical data. However, with very few exceptions, the retirement of these systems will not provide significant sources of cost savings, as many of them are in effect desktop technological supports for what are essentially manual processes. We think the State's approach to retiring these systems when they become no longer useful (as historical data sources) is the right approach; highlighting them at this point would only serve to make nervous those State workers who rely on them for doing their daily work — an emphasis on adoption of the new system is much better. However, it is key that new State business be conducted solely on the new system as soon as it is capable in each area; the existing systems should not be available as "crutches" or alternatives to the new system, once testing, deployment, and Agency acceptance is complete. The Agency leads and ADS-assigned Agency IT support personnel are good sources of assistance in this area, as they are "on the ground" where the existing systems are in use.

IMPLEMENTATION ARCHITECTURE

The State prefers software solutions that are configurable rather than customizable or purpose-written. "Configurable" implies that the software functions or features specifically suited to the State's requirements can be implemented in the solution by pre-existing software "switches" or entry points, rather than by writing computer code ("customizing") which is embedded in the solution. Customized solutions can tend to be hard to update, to understand long after the fact, and to change when needs change (e.g., a change in relevant legislation or a change in State procurement processes). A true SaaS

single-tenant solution, such as the proposed solution, can be updated for all customers (e.g., when a new major or minor version is released) with a minimized risk of "breaking" the application due to customized code embedded in a particular customer's solution.

The proposed solution is highly configurable, meeting the State's preference. A highly configurable system does not imply that State personnel will configure the system. Configuration of a complex and extensive solution like this requires experience and a comprehensive understanding of the system. This knowledge is to be provided by the implementation vendor, who will elicit and understand the State's requirements and implement them via the configuration. This is a stepwise process, by which State requirements will be implemented, tested, revised as necessary, and ultimately accepted by the State through an Acceptance Test process. (Typically, certain parts of the configurable system will be under the direct control of State users, but the above process describes the bulk of the implementation phase.)

As stated elsewhere in this report, broad — ideally, complete — adoption of the eProcurement system across State government will be essential to realizing the benefits of the system most effectively. In the context of configuration and implementation, we heard from the project "Agency Leads" a consistent message that a "one size fits all" approach to system processes will not be effective or indeed even workable. Different Agencies and Departments have differing needs in the general procurement process: often, this depends on an overlay of compliance needs due to Federal funding, State and/or Federal statutory requirements, the way the market works in any particular procurement area, and the characteristics of vendors and suppliers. One of the very attractive features of the Ivalua solution, as perceived by these Agency leads, is that it remains highly configurable at a granular level — in other words, it is adaptable to these idiosyncratic needs. In our opinion, a key component of achieving broad adoption will be ensuring that the people close to the procurement process in Agencies and Departments have sufficient and continuing involvement during the implementation phase to adapt the system to these needs. We suggest that without such adaptation, there would be a tendency for State users to "fall back" to manual, deprecated processes, "going around" the new system and avoiding full adoption.

USER INTERFACE

End users, including both State users and external users (vendors, potential vendors, general public) access the service using commonly accepted web browsers, with access from mobile devices provided by mobile-friendly web pages, maintaining the same overall user interface architecture across desktop and mobile applications.

NETWORK ARCHITECTURE

The proposed solution is hosted in data centers employed by the solution vendor. All components of the SaaS solution are hosted in these data centers (see **Security**, *below* for compliance details). The disaster recovery approach relies on a fully-duplicated and hot-standby infrastructure. The sites are geographically separated, use different hosting and Internet service providers, and have identical service levels. The maximum recovery time in a worst case scenario is 4 hours.

All traffic from all State users within the State network employs the State network infrastructure for transport, and traffic leaving the State network exits through the State's Internet connection(s) and traverses the Internet to reach the hosted solution. All data in transit and at rest is encrypted.

Interfaces between the solution and State data sources and data sinks (e.g., the VISION financial system) traverse the State network in a way similar to the above. The solution is capable of employing business logic for transactions that meets State preferences and data best practices, including RESTful API, SOA/SOAP, EJB, PS Integration Broker (JMS), as well as other methods such as sftp and telnet. As these latter methods are deprecated in State preferences, we identify as a risk. (**_RISK_ID# _R4_**)

All traffic from users outside the State network uses normal public Internet connections to reach the web hosted solution. All data in transit and at rest within the solution is encrypted.

Our discussions with State Enterprise Architecture and IT personnel on this project revealed anecdotal evidence that the State network has experienced too-frequent performance and other problems. The cause(es) of these performance problems has not yet been identified. We identify as a risk (**_RISK_ID# _R3_)** that performance issues on the State network may result in issues with the consistency, reliability, and general performance of the proposed solution, which in turn could result in State users occasionally returning by perceived necessity to employing manual or otherwise deprecated procurement methods. Any risk to broad adoption can be a risk to realizing the benefits of eProcurement. The State is addressing this issue by a separate project of network redesign and upgrade which is now underway and ongoing. We do recommend that the network improvement effort should be in explicit communication with the eProcurement project, probably through the project's risk management process.

DATA AND INTERFACES

The proposed solution will interface to the State VISION financial system (currently PeopleSoft ver. 9.2) using State preferred best practice methods.

The VTRANS STARS Financial Management System, required for use in certain Federally Funded projects, will also be integrated with the eProcurement system.

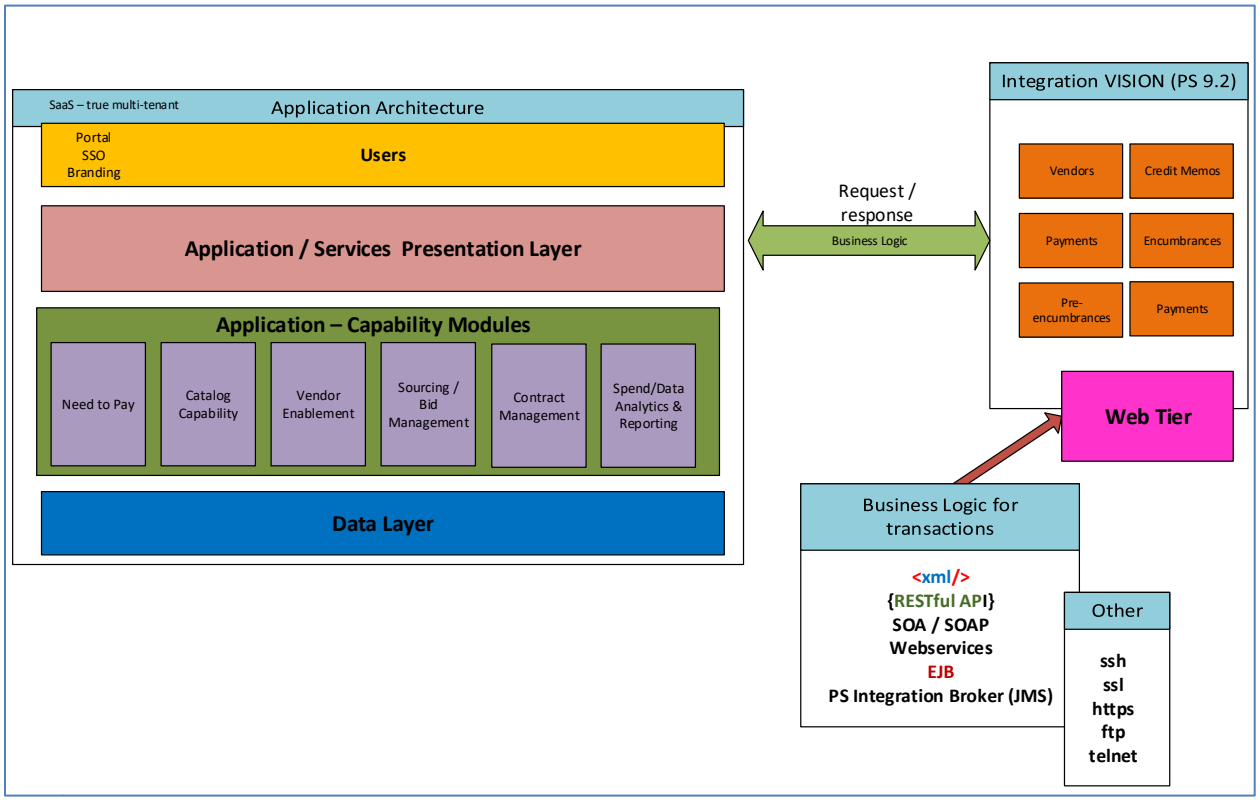
Some third-party software platforms used by the State in various units will also be integrated. It is possible that some other existing State data systems may be integrated if the need surfaces during the implementation requirements discovery process.

A fuller description of data integration points will be found in **System Integration,** below.

The largely manual systems currently in use in various Agencies and Departments employ a number of very basic data storage methods, mostly productivity tools such as Excel spreadsheets or Word documents. It is expected that the data from these deprecated methods will be ported in the new system as needed. The State's chief data officer expects that most of these data conversions will be relatively straightforward, with no need for employing additional data conversion expertise beyond that

existing in State personnel. There will be some need to determine how much back conversion of existing historical data may be useful. One interesting point raised in our conversation with Agency Leads is that Agencies or Departments may rely on certain historical data in making sound purchasing decisions, and that the new system should recognize and incorporate that data when appropriate; for example, some units may maintain a list of vendors who failed to perform or deliver on past procurements.

The following diagram from the Enterprise Architect assigned to the project shows the logical architecture of the solution:



COMPATIBILITY WITH THE STATE'S STANDARD OFFICE AUTOMATION PRODUCTS

For various reasons, including the fact that the proposed system is intended to handle the development of procurement documents such as requests for proposals or information (RFPs or RFIs) as well as contracts, standard provisions, and amendments, the proposed system must integrate with the State's standard Office Automation products. The proposed system is compatible. Its reporting tools natively report to Word, Excel, and PDF, and the contract tool can import Word documents, break text into clauses, and also export to Word or PDF. Search tool results can export to list form in Excel. These capabilities are appropriate.

CATALOG CAPABILITY

Vendor catalogs provide access, from within the eProcurement system, to item and commodity price listings for use by State users, streamlining and simplifying the procurement process, especially within the Need-to-Pay workstream. Ideally, these catalogs should be accurate and up-to-date. Catalogs are of two types: hosted and punchout. Hosted catalogs are static product listings, uploaded by the vendor into the eProcurement system, and utilizing the Catalog Interchange Format (CIF). The vendor is responsible for uploading updated catalogs as needed. Punchout catalogs reside on the vendor's website, although the State user accesses and views the catalog within the State's eProcurement system (i.e., the user "punches out" of the eProcurement system to view the catalog). Punchout catalogs use OCI or cXML as an interchange format. With punchout catalogs, the vendor need only maintain their own website catalog using their own internal methods, and do not have to upload an entire new catalog to effect changes.

6.1 STATE'S IT STRATEGIC PLAN

DESCRIBE HOW THE PROPOSED SOLUTION ALIGNS WITH EACH OF THE STATE'S IT STRATEGIC PRINCIPLES:[8]

TRANSFORM OUR CUSTOMER EXPERIENCE

This project is, at its heart, a plan and a method to improve efficiency, cost, and effectiveness of the State's procurement operations across all of State government by providing much more powerful, intuitive, and state-of-the-art procurement tools to the State's workforce. Throughout all our conversations with project participants, we heard a consistent commitment to increasing efficiencies and capabilities without loss of jobs. We think the available evidence shows this is clearly the right approach. In our opinion, the solution has the potential to empower the existing workforce to accomplish State objectives by means of technological tools that most State workers will welcome.

INNOVATE AND OPERATE EFFECTIVELY, EFFICIENTLY

The project Charter defines the project Objectives with associated Success Criteria. We think the Objectives are realistic — based on professional advice and consultation, referencing successes in other jurisdictions. The Success Criteria are similarly well-chosen. As described more fully in 8. Cost Benefit Analysis, below, there will be challenges in gathering baseline criteria data over the widely distributed and idiosyncratic existing procurement systems employed by the State; nonetheless, the approach taken is appropriate and we support it.

[8] Vermont Agency of Digital Services (ADS), *2019 Strategic Plan, Information Technology Activity Report ($500K Project Report)*, PDF pg. 100.

INVEST IN OUR TECHNOLOGY

The proposed project relies on using existing State infrastructure – i.e., desktop access for users via web browsers, State network infrastructure – to implement the State-resident portion of the solution. It is therefore making complete re-use of existing technology without acquiring any new hardware. We do point out in Section 6, Technology Architecture Review, Network Architecture, above, that the solution is dependent on the functioning of the State network, which is reported to have had some reliability issues. Based on our discussions with project team members, we expect the State will focus attention on resolving these issues going forward.

SECURE VERMONT'S DATA

The project team, especially via EA, has focused deeply on integration of the system with existing State data in the 6 workstreams (as described in 6.8 System Integration, below). All of these integration points are defined with appropriate security and privacy controls and follow best practices for integration. The data contained entirely within the system is similarly well-architected, following best practices for security, privacy, and data movement.

DEVELOP STRATEGIC PARTNERSHIPS

The core project team was assembled from stakeholders and experts across a broad range of Agencies. The result was a deeply effective assessment of business, technological, and user needs.

Project management has been applied consistently and appropriately throughout the project since the early part of the procurement process, using ADS resources and keeping adequate records of project progress, following general PMBOK guidelines.

The project team consistently engaged with competent sources of eProcurement knowledge through the project conception and procurement phases, and continue to do so now, in the contract negotiation phase. The National Association of State Procurement Officers (NASPO) continues to be a crucial source of collegial advice, formal consultative assistance, and information about the experiences of other state eProcurement (and other procurement) efforts. Civic Initiatives, LLP, contributed significantly to the creation of the RFP, applying a broad experiential base to Vermont's business needs and requirements development.

LEVERAGE CLOUD SERVICES

The proposed project is a pure SaaS deployment with highly secure remote and recoverable hosting, meeting or exceeding State preferences and requirements. The solution is single-tenant, and the solution vendor has significant and continuing experience providing the same solution to other governmental entities. This broad base will, in our opinion, tend to advantage Vermont by providing scale economies of both cost and functionality.

IT AND BUSINESS ALIGNMENT

The project team employed support from ADS Enterprise Architecture from an appropriately early point in the development of the project. The Enterprise Architect developed a project EA Vision Document, contributed to the development of State requirements, helped tie those requirements explicitly to business needs, participated in the scoring of functional requirements and non-functional requirements, and cooperated in other ways as a member of the core project team. We think EA participation in the project has been comprehensive and appropriate and has succeeded in assuring that the project as it goes forward is in very close alignment with State/ADS EA preferences and objectives, while supporting business needs in granular detail.

As described above, the State currently employs a variety of procurement processes to achieve business needs across various Agencies and smaller units. All of these processes have been somewhat disconnected from each other, except in a general procedural and financial data collection manner (financial VISION system of record, Bulletin 3.5, AGO oversight, ADS oversight, some standard contract provisions and shared boilerplate). This system employs IT to standardize, regulate, and interconnect business processes across government (as well as for the State's vendors), while maintaining the flexibility to adapt to "local" (e.g., departmental) needs.

FEDERATED SUPPORT MODEL (FSM)

The 2019 Strategic Plan describes FSM as "an operational framework designed to carry out the State's IT strategy using a federated approach utilizing layers of system administrator roles and responsibilities with strong governance."[9] It "decentralizes policy setting, enforcement and implementation to allow those nearest to the tool/function to have the greatest amount of self-service capability."[10] The present project adheres to this framework by identifying "Agency Leads" – subject matter experts within the Agencies – who inform and assist the project team by defining business needs and operational constraints. ADS IT managers within the Agencies perform a similar function for IT needs. All are related through a consistent project management communication process to the core project team.

6.2 SUSTAINABILITY

TECHNOLOGY SUSTAINABILITY

The pure SaaS nature of the selected solution contributes greatly to its sustainability, for at least these reasons:

- As a single-tenant service, it gains the advantages of updates across the solution provider's user base (while maintaining application and data independence), thereby to a certain extent making it "future-proof"

[9] *Ibid*.

[10] Vermont Agency of Digital Services (ADS), 2019 Strategic Plan, pg. 18

- Similarly, the configurable nature of the solution allows it to evolve in response to changes in statute, regulations, business processes, grant compliance, and spend analysis
- As a pure SaaS solution, it does not depend on any State hardware (aside from network infrastructure and web browsing devices), making it independent of any changes in State hardware, with no need for hardware refresh over the lifecycle
- The solution employs standard, best-practice communications protocols and methods, making it compliant with State preferences and likely to be compatible with future State data interfaces as the need arises

Additionally, the proposed project has been assessed throughout the procurement process by Enterprise Architects, Subject Matter Experts (SME), and the Agency of Administration for its compatibility with the State's Enterprise Resource Planning effort. This minimizes any chance of incompatibility with new or updated portions of the ERP effort, avoiding future unintended costs outside the current scope of the project.

ENVIRONMENTAL SUSTAINABILITY

The implementation vendor makes the following statement:[11]

> *KPMG is proud of the success of our environmental sustainability initiatives. Between 2007 and 2010 we achieved a 22 percent reduction in gross emissions per full-time equivalent (FTE) employee. Between 2010 and 2015 we achieved a net 26 percent reduction per FTE. That number reflects a combination of factors, including an increase of employees, a decrease in office electricity usage, investments in renewable energy, and active management of our air and car travel.*
>
> *In 2016, KPMG pledged to further reduce our net emissions by 10% per FTE against baseline year 2016 and to purchase 100% renewable energy for our offices by 2020.*
>
> *Since 2010, we've also championed sustainability by:*
>
> - *Reducing office electricity by 32%;*
> - *Increasing our use of renewable energy to 37% of total consumption;*
> - *Increasing number of LEED certified offices to 37; and*
> - *Reducing paper consumption by 29%;*

The solution itself is pure SaaS, therefore it removes the bulk of the carbon footprint from Vermont, leaving primarily the footprint of the State's network infrastructure and desktop devices. We acknowledge her that data centers themselves are significant users of energy, consuming roughly 3% of

[11] KPMG, Proposal, pg. 8

all globally generated power and accounting for approximately 2% of greenhouse gas emission.[12] However, large modern consolidated data centers are likely to be significantly more efficient than on-premises deployments. We think the choice of solution model here is likely a net reduction in carbon emissions.

6.3 SECURITY

DATA PRIVACY AND SECURITY COMPLIANCE

The State's RFP required vendors to verify compliance with various State and Federal Standards, Policies, and Laws covering the following types of data:

- Publicly Available Information
- Confidential Personally Identifiable Information (PII)
- Payment Card Information
- State Financial Data
- Federal Tax Information
- Personal [Protected] Health Information (PHI)

For several of these types, the selected solution vendor indicated non-compliance, although for those types, the vendor indicated an-progress process intended to update the vendor's status to compliance (i.e., FedRAMP audit and certification) that will meet or exceed the State's requirements. While this process is appropriate and is expected to result in that audit and certification, we identify it as a risk (**_RISK_ID# _R9_)** and recommend requiring sufficient detail on compliance timing (i.e., pre- or post-go-live). The State agrees and states "we need a solidified timeline with dates and milestones of when they believe that they will be compliant. If their compliance will be in effect prior to 'go-live' then the risk is low. If the dates are post 'go-live,' the contract must address the vendor's obligation to meet the agreed upon dates." We agree with this sentiment.

SECURITY NON-FUNCTIONAL REQUIREMENTS (SECURITY NFRS)

Note: specific NFRs are referenced by a number assigned in the RFP, shown in brackets. Ex: [S17]

The State identifies 19 Security-specific NFRs, to which bidders were required to address as to compliance (Yes, No, N/A). These NFRs addressed:

- Input validation
- Output encoding
- Authentication and password management (see User Access Management Controls, below)

[12] https://data-economy.com/data-centers-going-green-to-reduce-a-carbon-footprint-larger-than-the-airline-industry/, accessed June 30, 2019.

- Session Management
- Access Control (also see below)
- Cryptographic Practices
- Error handling and logging
- Data protection (see above and below)
- Communication security
- System configuration
- Database security
- File Management
- Memory Management
- Fraud detection (see below)
- General Coding Practices
- POA&M Management
- Risk Assessment Practices
- Incident Response planning and testing
- System Security Plan delivery

The selected vendor indicated "Yes" to all 19. The narrative explanations were concise but sufficiently detailed to indicate both an appropriate level of technical understanding to achieve compliance. The audit/monitor process for each NFR was appropriate to the compliance method (with one exception, following below). We note in particular that General Coding Practices identifies source code control practices conforming to the Open Web Application Security Project (OWASP) guidelines and models. This is in alignment with State of Vermont Enterprise Architecture Guiding Principles for software coding practices. Additional, several NFRs address aspects of User Access Management, more of which is described below. The other responses also reflect up-to-date best practices and align with State preferences.

The CISO Security Analyst for this project identified a concern with the response to [S17], requiring "Risk Assessment Practices including but not limited to vulnerability assessment and pen[etration] testing." The vendor's response indicates appropriate methodology for identifying security risks, however it is insufficient in describing the methodology for assessing the severity of security risks. We agree with the Analyst and identify this as a risk (**_RISK_ID# _R8_**). We agree with the State's mitigation of this risk, in recommending that the State require further clarification of the assessment method.

USER ACCESS MANAGEMENT CONTROLS

The entire eProcurement solution employs a Windows Active Directory (AD) supported role-based access/authentication scheme. This scheme is consistent with, and can be integrated with, the State's AD system(s). (The State employs Microsoft Azure AD as an access management system.) The solution's role-based access uses the principle of "least privilege," the concept and practice of restricting access rights for users, accounts, and processes to only those resources absolutely required to perform the user's legitimate activities. Simply put, users can perform only those activities, and access only those

parts of the system, that are necessary for them based on their "roles": i.e., their jobs, their assigned tasks, their authorities, and/or their functions within the eProcurement system (a user might be a vendor, for example, in contrast to being a State employee). As examples, purchasing agents have different roles from Spend Analysts or Pre-qualified vendors or Contract Managers.

The eProcurement solution uses this role-based access with a Single Sign-On (SSO) system, meaning that users need only sign-on to the system once in a given session, and are given access to all allowed or appropriate functions of the system based on their roles. This simplifies the process of managing access rights for users, as access rights can be defined by role for every function of the system, and user roles need only be defined once for each user (although the roles may be multi-dimensional).

Note that roles can change: A State employee may be promoted to a job with greater purchasing responsibility and a need for more extensive access; a vendor may be granted a new retainer contract. The opposite may also happen: A State employee could be terminated; a vendor may receive a downgrade in qualification. In these latter cases (as examples), it will be important to propagate the new status through the system as quickly as possible to preclude any possibility of bad or unauthorized actions or access to information.

Since the solution can be integrated with the State's AD system(s), the technical infrastructure will be in place to allow the state to control and manage user access (similar to the way in which Azure AD is already used to control access to Office 365, portals, or other State network resources based on user needs and authorities). **However capable the access management architecture is, it will still be incumbent on the State to develop a human resource and access management internal process by which accounts are flagged specifically in regard to eProcurement access, so that changes in user role status are properly propagated instantly. The State already has experience doing this for access to other resources, as stated above. There may also be a need to do this is a somewhat similar manner for some or all vendors as users.** Although this is a State responsibility, discussions with the vendor may elicit good suggestions or advice based on the experiences of other government and commercial customers in areas such as on-boarding, off-boarding, access audits, and access reviews.

IRS SAFEGUARDS AUDIT

The State Security Analyst for this project has pointed out that the way some requirements written by the State in the RFP Requirements Traceability Matrix (RTM) section on Vendor Enablement & Management, and required in response from bidders on this project, might actually or by interpretation impose functional requirements on the system that could require an IRS Safeguards audit trail and review under IRS publication 1075. We identify this as a risk (**_RISK_ID# _R10_**), because it is not clear that the State would want to have such an Audit be required, or whether clarification of these requirements might avoid that burden. We recommended that the State consider whether these requirements should be reformulated. The State responds that it will list the requirements that pertain to this and find whether the vendor can meet them or not. The IRS has proven flexible regarding

timelines for remediation and implementation. The vendor's commitment to meeting any identified shortcomings from an audit is the key to successful mitigation of the risk.

6.4 COMPLIANCE WITH THE SECTION 508 AMENDMENT TO THE REHABILITATION ACT OF 1973, AS AMENDED IN 1998

The implementation provider, speaking to the 508 compliance of the Solution itself, makes the following statement in their proposal:

"We will provide and maintain the necessary appropriate compliance standards and have an ongoing commitment to support 508 and web accessibility standards and guidelines. Our commitment to quality and forward progress combined with our new advanced ability to deliver quick short updates on a short timeframe will allow us to help ensure continued compliance with future requirements."

Providing 508 compliance via solution design is generally considered a responsibility of the vendor, and the State makes clear that expectation in its RFP. Review of 508 compliance at the time of Acceptance Testing would fall under the State's 508 compliance officer.

6.5 DISASTER RECOVERY

The solution provider's disaster recovery plan (DRP) relies on the use of a hot spare site. Under normal conditions, the primary site replicates every day (or more often depending to the SLA) all the hosted data.

The solution provider's continuity plan does not rely on third party / subcontractors nor does it rely on the availability of one datacenter. Solution provider IT staff are responsible for switching applications from one Datacenter to another.

The provider's DRP is tested at least each year.

The contingency plan includes the following elements:

- Geographically separated site
- Different hosting and internet service provider
- Service level on the recovery site is equivalent to the service on the primary site (no degradation of service after the switch to the recovery site)

The Service Level Agreement (SLA) identifies the following targets and guarantees for disaster recovery:

Maximum data loss (RPO): 12h maximum for the Platinum service level option selected by the State. This maximum data loss is provided by the automation of full and incremental backups then the

synchronization of those backups on the DRP. The frequency and the synchronization time of backups into the DRP play into this commitment.

Info: In case of data corruption is not detected quickly, the solution provider will keep 15 days backups online to restore to the last day.

Recovery time (RTO): 4h for the Platinum service level option selected by the state. This recovery time is provided by the continuous site preparation and server into the DRP as well as the provision of human resources required for the implementation of the switch.

The provider's DRP includes the following steps:

- Discovery and first analysis of the problem
- Communication with the team (client support, project manager, director)
- Communication with the impacted clients
- Preparation of the DRP (restore the most recent database)
- Decision to switch to the backup site
- Communication with the internal team and the impacted clients
- Switch to the backup site (start application on the recovery site, switch DNS)
- Communication with the internal team and the impacted clients Tests
- Normalization Plan

Switch Decision criteria for the above steps [Note: The switch generates a service interruption and a possible data loss, so the decision should be taken cautiously.]:

- Nature of the incident on the main site:
  - Force majeure (flooding, fire, earthquakes, …)
  - Generally, any incident which generates a downtime greater than the time to switch over. As soon as an event generates a significant downtime (over 15 minutes) Ivalua IT team initiates the DRP restore process which may or may not reach the point of an actual DRP switch.
- Estimated time of recovery on the main site by the host and/or Ivalua
- Volume and criticality of data lost when switching
- Data recovery ability after the last backup

In any event the final decision is taken by the client (activate, do not activate, or delay the switch)

ASSESSMENT:

The description of the DRP in the solution provider's proposal is fairly general, but given the State's approval of the solution's architecture and security, combined with the provider's experience in similar deployments, we do not identify this as a risk, but rather expect that post-contract execution sharing of

DRP details and testing results with the State will provide sufficient additional detail. We do note that a switch over into DRP mode of the system generates a service interruption and possible data loss. The final decision to activate or delay the switch is taken by the State, following notification and communication by the solution vendor. **Therefore, we recommend that the State, in consultation with the solution vendor, develop a clear protocol for communication and decision making in the event an activation of the DRP is indicated**.

6.6 DATA RETENTION

The solution vendor will retain historical data for as long as the State wishes to retain it. We expect the State would want to retain all historical data for the lifecycle of the project (and probably beyond). Given the technology architecture of the proposed solution, we see no reason why this should not be easily accomplished.

We would mention once again here that the VISION financial system maintains its status as the system of record for financial data; the proposed system would be the single and official repository for all procurement transactions and associated data, including Contracts.

6.7 SERVICE LEVEL AGREEMENT

WHAT ARE THE POST IMPLEMENTATION SERVICES AND SERVICE LEVELS REQUIRED BY THE STATE?

The RFP issued by the State requires the vendor to address the provided "State of Vermont standard set of Service Level Agreements (SLA) and associated Service Level Credits."[13]

The implementation vendor (on behalf of the solution vendor) included a sample or suggested Service Level Agreement (SLA), as required, in the proposal. The vendor agrees that a final SLA will be negotiated with the State.

The agreement sample seems comprehensive, generally adequate, and in the best interests of the State. It proposes two SLA statements: one covering Hosting Services, and one covering Maintenance and Support Services. The extracts included below **do not** comprise the full text and details of the SLA sample, but we include them here to summarize Fee Credits the State would be entitled to in the event of missed service level objects of varying severity or duration. The complete sample SLA explains all terms and conditions in comprehensive detail.

[13] State of Vermont, eProcurement RFP, p. 44

HOSTING SERVICES SLA

Service Level Objectives (SLO) Matrix	
Hosting Services – Availability Percentage (Monthly)	Hosting Services Level Credit (Prorated Monthly Hosting Services Fee)
99.8% and above	0%
99.8 – 99.0%	5%
98.99 – 95%	25%
94.99 – Below	50%

By the 10th of each month, for the applicable Service Level(s) Ordered, Ivalua will provide Customer a report comparing the Availability Percentage for the prior month with the Service Level Objective ("SLO" and "Report"). In the event a Report shows the Availability Percentage in the prior month below the SLO, then to the extent of the default specified in the SLO Matrix ("Service Level Default"), the stated Service Level Credit(s) shall apply for such default. The cumulative maximum Hosting Services – Service Level Credits that may be claimed for any given month shall not exceed Fifty Percent (50%) of the affected Hosting Services Fee paid for the applicable month.

MAINTENANCE AND SUPPORT SERVICES SLA

Service Level Objectives (SLO) Matrix				
Customer defect reporting	Severity level	Response target	Workaround target	Resolution target
Customer has logged the defect in Client Support Extranet (CSE)	1 (Blocking Defects)	Within 1 hour	2nd business day	Next Maintenance Release
	2 (Major Defects)		5 business days	Future Maintenance Release
	3 (Minor Defects)	Within 24 hours	Determined case by case	Future Maintenance or GA release, Ivalua's discretion
	4 (Enhancements)			

In the event Ivalua's average response time, within a service month, to all Severity Level 1 and 2 Defects, does not meet or exceed the applicable SLO in the SLO Matrix above (each a "Service Level Default"), the following Service Level Credits shall apply for such Service Level Default(s).

Response Target timeframe begins at the time the Parties agree on the Severity Level

- First month of Service Level Default: The Parties shall meet to discuss possible corrective actions.
- Second month in a twelve (12) month rolling period: Five Percent (5%) of the affected Software Services Subscription Fee paid for the applicable month.
- Third month in a twelve (12) month rolling period: Ten Percent (10%) of the affected Software Services Subscription Fee paid for the applicable month.
- Fourth month in a twelve (12) month rolling period: Fifteen Percent (15%) of the affected Software Services Subscription Fee paid for the applicable month.

RECOMMENDATION

One confusing point arises in the "Consolidated BAFO Clarification" document, where the implementation vendor writes:

This Schedule governs the Service Levels that will be used to measure KPMG's performance of the Services under the Agreement. KPMG is willing to put 10% of monthly fees at risk tied to SLA's. In no event will the aggregate amount of Service Level Credits payable by KPMG with respect to all Service Level Defaults in a month exceed the at-risk amount (10%), even if Service Level Defaults occur for a group of Service Levels for which the sum of their Service Level Credits would otherwise have exceeded the monthly at-risk amount (10%).

This is difficult to interpret in light of the Hosting Services statement above. It seems the implementation vendor is distinguishing its (KPMG's) liability from the solution vendor's (Ivalua's). That's understandable; however, it is not clear how to interpret the SLO Matrix in light of this statement. We recommend and expect that the State will seek clarification and sort this out in negotiations.

IS THE VENDOR PROPOSED SERVICE LEVEL AGREEMENT ADEQUATE TO MEET THOSE NEEDS IN YOUR JUDGMENT?

Yes. The SLA is structured in a way that is adequately comprehensive and provides a useable basis for discussion within the ongoing contract negotiations. The proposal includes sufficient detail and is responsive to, as well as reflective of, Vermont's standard SLA requirements. The solution vendor is experienced in providing similar guarantees for other governmental entities with similar requirements. This suggests an understanding of the responsibility of making every effort to meet performance targets.

6.8 SYSTEM INTEGRATION

IS THE DATA EXPORT REPORTING CAPABILITY OF THE PROPOSED SOLUTION CONSUMABLE BY THE STATE?

Yes. There appears to be a deep understanding and analysis of the integration architecture contemplated for this project. We appreciate the fact that the team has begun to address the details at an early point in the development of the project (i.e., integration groundwork laid before RFP development; data stream identification as above at the current pre-contract execution point, to be certain all necessary preparation is ready for implementation kickoff).

This early work ensures that the proposed solution's data will be consumable by the State's data systems and that the State's data will be compatible with the solution. The vendor has a deep understanding of, and experience with, data exchange with the systems employed by the state. Data transfer protocols appear to be state-of-the-art, secure, and reliable.

In short, we think the State has approached the questions of data exchange properly and systematically, and the vendor(s) responded in kind. Resources dedicated to data questions during the implementation period appear to be sufficient and properly qualified. We have no reservations about the vendor(s) and State accomplishing this need during the implementation and operational period.

WHAT DATA IS EXCHANGED AND WHAT SYSTEMS (STATE AND NON-STATE) WILL THE SOLUTION INTEGRATE/INTERFACE WITH?

HIGH LEVEL OVERVIEW

From a very high level perspective, the eProcurement system integrates with State data sources and data sinks at 2 major points:

- The VISION financial system (Oracle PeopleSoft Financials v9.2 currently)
- The VTrans STARS Financial Management System, required for compliance with certain funding sources

As well as with a small number of 3rd party applications:

- OneSpan Sign, used to capture electronic signatures
- Azure Active Directory
- State of Vermont Active Directory
- State of Vermont public information website(s)

DATA STREAMS

At a more granular level, the project team, has identified the various data integration points by workstream as shown in the following table:

Source to Destination	Data	Method	Direction	Workstream
Ivalua to VISION	Vendor Create	Real Time	Bidirectional	Vendor Enablement / Mgt.
Ivalua to VISION	Vendor Update	Real Time	Bidirectional	Vendor Enablement / Mgt.
Ivalua to VISION	Contracts/Amendments	Real Time	Bidirectional	Contract Mgt.
Ivalua to VISION	Chart of Accounts	Batch	Inbound	Need to Pay
Ivalua to VISION	Budget Checks	Real Time	Inbound	Need to Pay
Ivalua to VISION	Pre-Encumbrance (PR)	Real Time	Bidirectional	Catalog Capability / Need to Pay
Ivalua to VISION	Encumbrance (Purchase Order/Purchase Order Change) (PO/POC)	Real Time	Bidirectional	Need to Pay
Ivalua to VISION	Receipts	Real Time	Bidirectional	Need to Pay
VISION to Ivalua	Invoice/OK to Pay	Real Time	Outbound	Need to Pay
Ivalua to VISION	Payment Information	Batch	Inbound	Data Analytics & Reporting

Source to Destination	Data	Method	Direction	Workstream
Ivalua to STARS	Contracts/Amendments	Real Time	Outbound	Contract Mgt.
Ivalua to STARS	Encumbrance (PO/POC)	Real Time	Outbound	Need to Pay
OneSpan Sign	Integration			

Please create a visual depiction and include as Attachment 1 of this report.

[See attachment 1]

Will the solution be able to integrate with the State's Vision and financial systems (if applicable)?

Yes, this is a primary objective of the project and is in-scope. See **System Integration**, *above*.

Additional Comments on Architecture:

none

7. ASSESSMENT OF IMPLEMENTATION PLAN

The implementation vendor in their proposal presents a sample recommended plan and approach for implementation. In ongoing contract negotiations, the State may choose to amend this plan in various ways – flexibility which we encourage for reasons explained further below. That stated, we think the approach suggested by the vendor is comprehensive, unusually detailed for a proposal, and very likely to succeed in its main objectives.

The overall approach is to deliver "consumable chunks of holistic business capability" – i.e., fully functional portions of the whole system addressing pre-defined organically circumscribed business needs. This production capability would come into effect at approximately 2 months intervals, starting in the 8th month (see sample timeline on the following page). Deliveries would proceed in months 10 and 12. Altogether, a 14 month period is projected for implementation.

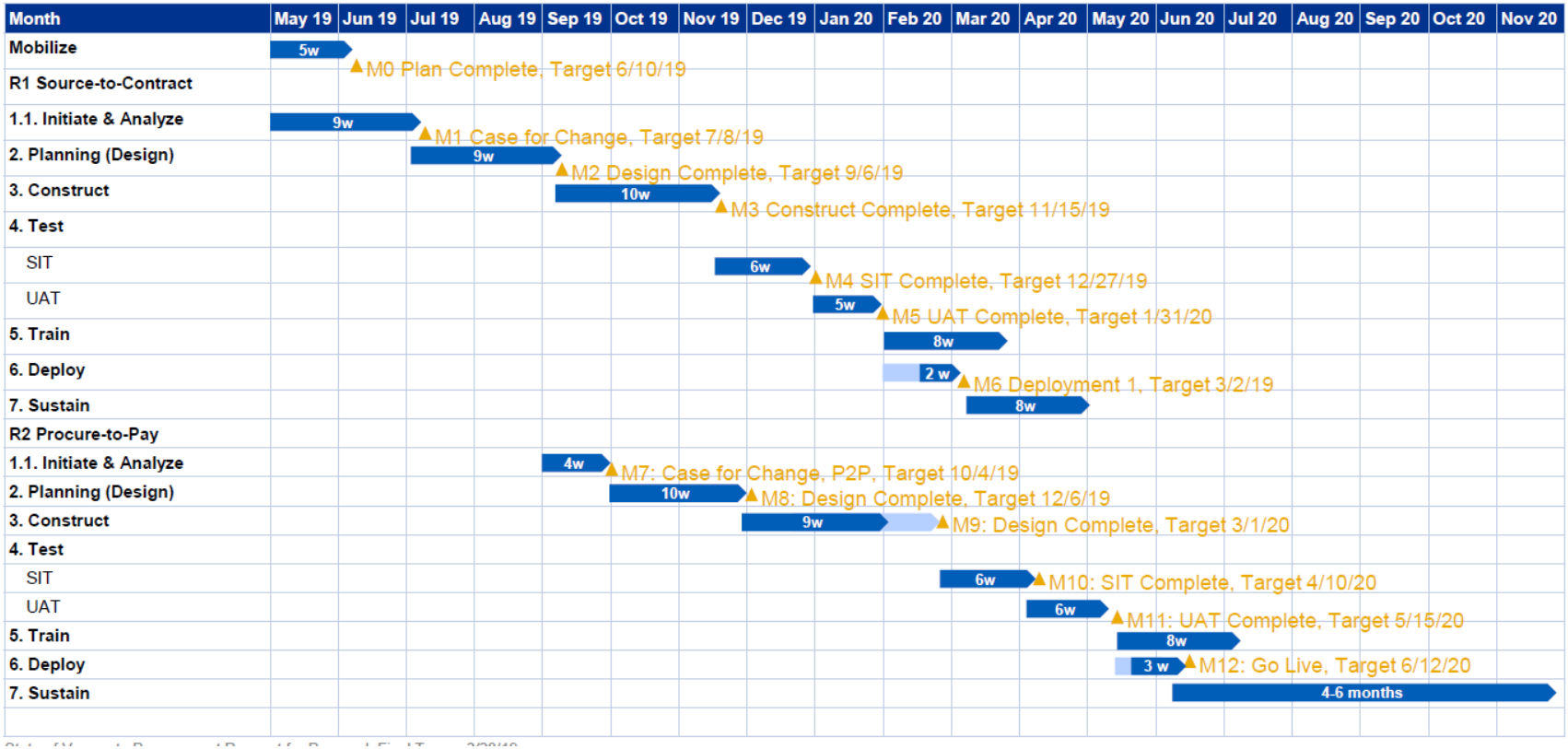
The implementation vendor recommends that the solution be delivered through two distinct functional workstreams and two different "go-live" points. See **7.3.7 Implementation**, *below*. Details about these functional workstreams are included in the vendor's implementation sample and go into sufficient and comprehensive detail.

The State's RFP requested a development approach that is "Agile-like," consisting of "iterative functional deployments to make functionality available to users in a methodical and incremental manner."[14] The vendors' implementation approach model is termed "hybrid," and utilizes both agile and waterfall methodologies. In commonly held views, agile methodology is thought to be short in time scale, highly responsive to customer need, quick to discover problems and implement change, and low in schedule risk – yet not very responsive to long-term planning. Waterfall methodology, in contrast, is good at modular development, responsive to long-term planning, and adaptable to extensive documentation – yet slow to discover problems and not as closely connected to the customer. The vendors' approach seems to apply waterfall to the long-term planning and delivery of the project, and agile to the small-scale, customer-responsive aspects. We think this is appropriate, given an adequate governance and communication model.

The governance and communication model for implementation as proposed by the implementation vend is very well designed. They offer a facilitation approach they call uCollaboration, to elicit and use stakeholder input via a face-face methodology for building consensus between stakeholder groups. Whether or not the State finds this approach desirable, we think that the fact it is offered indicates a thoughtful and tested approach on the vendor's part.

[14] *Ibid.,* p.28

The project timeline as suggested by the implementation vendor, in the Final Terms presentation. This timeline was created using a projected May, 2019, start date. The actual timeline would be shifted to begin after contract execution, but the total length in months would be approximately as indicated.



7.1 THE REALITY OF THE IMPLEMENTATION TIMETABLE

This project is extensive in scope, affecting quite literally every Agency, Department, Commission, and Board of State government, and potentially other associated entities such as education institutions. The timetable is appropriately aggressive, but not unreasonably so, to keep focus and enthusiasm at peak avoiding too many mid-stream changes. The implementation vendor's detailed approach to the process provides adequate assurance that project success is feasible and likely.

As with many large-scale IT implementations in State operations employing experienced vendors, the greatest challenge to the timeline will tend to be the ability of the State to respond consistently and in a timely manner to the need for: participation, responsiveness, clarity of business needs, user case development, testing approval/disapproval, and emerging questions. The present project envisions the employment (aside from the vendor contracts) by the State of a limited term Organizational Change Manager and an ADS project manager. Both of these are good choices.

The "2 workstreams and 2 go-live points" approach of the vendor demonstrates the experience of the vendor in proposing an approach that reflects the State's requirements and particular characteristics (size of the project team, size of the user base, integration points with VISION and STARS, ability to dedicate resources). The State has been assessing this approach and may require some adjustments to make sure that the timeline does not over-stress State participation — as a purely hypothetical example, by creating a situation where too many Agencies must respond to project needs at the same time, potentially stressing State coordination and response capabilities. So, we acknowledge and encourage the State to adjust the vendor's proposed approach as needed, to further ensure the likelihood of the project implementation completing in the expected timeframe.

The implementation vendor describes in appropriate detail their working relationship with the solution vendor. They also demonstrated their deep knowledge of and familiarity with the solution itself. This will be important to timeline success in two ways: first, by ensuring that there are minimal delays in the staging of the agile-like steps of the configuration process; and second, by increasing confidence in the handoff of the solution to the solution vendor.

7.2 READINESS OF IMPACTED DIVISIONS/ DEPARTMENTS TO PARTICIPATE IN THIS SOLUTION/PROJECT (CONSIDER CURRENT CULTURE, STAFF BUY-IN, ORGANIZATIONAL CHANGES NEEDED, AND LEADERSHIP READINESS).

We interviewed project principles, including the Deputy Secretary of the Agency of Administration, the business lead; project managers; ADS IT, EA, and Security resources; and the Agency Project Leads who represent "on the ground" interests in the project. In all of these interviews, we heard a fairly strong confidence that there is sufficient human resource and enthusiasm to carry the project without the addition of staff beyond those identified above. There is a broad understanding that, within a project of this scope and complexity, there will be times that there will be increased demands on Agency Leads

and on other business SME's within the various Agencies.[15] Deep stakeholder involvement in the early stages of the project has resulted in a marked enthusiasm for the project, which is clearly evident among the Agency Leads and Executive Levels, but also seems pretty likely to extend to staff in general once the project is underway. Also, at least in part, we think this is due to the State's dedication to preserving jobs (even if they may eventually change in task somewhat), so that this project is not seen as a threat to State employees' jobs.

We did hear some confusion among Agency Leads concerning the timetable for the project implementation, especially concerning the time when first functionality would be rolled out. Some had heard 6 months, others were unsure. We identify this as a risk (**_RISK_ID# _R5_**) to enthusiasm and project focus at the Agencies' levels. At the same time, it does not seem to reflect any confusion on the part of the project team; it seems to be just a matter of communication during this period of negotiations with the implementation vendor. We recommend a clear and well-communicated "line" on project implementation be communicated from the project team to potential users via the Agency Leads, and the State agrees.

Agency Leads, while very enthusiastic and optimistic about the project, expressed some unclarity on the amount of Agency human resources needed for the project during implementation period. They heard an early estimate of 1 FTE per Agency, but this has not been updated.[16] Project principals had not expressed to us any need for dedicated personnel beyond those already identified (i.e., PM, OCM, ADS resources). We identify this as a risk (**_RISK_ID# _R7_**) that project implementation could be under-sourced at the Agency/Department level.

Finally, the project team made a strong and successful effort to include a broad spectrum of stakeholders in the very earliest development of the project. This seems to have resulted in both a sense of needs being responded to and of various but generally high levels of buy-in, in response. Concerning vendors as users of the solution, we would note that larger vendors are undoubtedly familiar with eProcurement systems (and may indeed have some of their own for business-to-business procurement). We would expect them to be enthusiastic and accepting of the solution, providing the transition is relatively smooth. Smaller vendors are likely only vaguely aware of the project, if at all. This is appropriate, as they will not be impacted for many months. As shown by the experiences of other states, we would expect these small vendors to generally embrace the solution, as long as the transition is smooth, and ease of use remains high.

Regarding this last point, the Agency Leads expressed some concern about the smaller vendors, and especially the very smallest vendors, who may be geographically isolated and face technological challenges (broadband / cell network availability), which could discourage the vendors from using the system. We identify this as a risk (**_RISK_ID# _R6_**) to full adoption of the system (and full adoption is a

[15] Agency Leads Interview

[16] *Ibid*.

key factor in realizing benefits, according to studies[17]). The risk is that the State users who rely on these small vendors for a variety of necessary goods and services would have to "backfill" by relying on existing manual methods for these vendors, rather than fully utilizing the system. Additionally, this might disproportionately affect precisely those small vendors the project is, in part, hoping to bring into the competitive procurement process. The recommendation here is to explicitly plan and build-in small/challenged vendor onboarding. The State agrees.

7.3 DO THE MILESTONES AND DELIVERABLES PROPOSED BY THE VENDOR PROVIDE ENOUGH DETAIL TO HOLD THEM ACCOUNTABLE FOR MEETING THE BUSINESS NEEDS IN THESE AREAS:

7.3.1 PROJECT MANAGEMENT

The implementation vendor's proposal describes a deep and broad project management outline and plan that we find to be extensively interconnected and properly staged. It is closely tied to PMBOK principles and PMP approaches. Several proprietary tools or approaches, including an internally-developed methodology called Portfolio, Program and Project Management (3PM), bespoke tailored for the present project.

PM Deliverables

- Develop and Approve Project Charter
- Report to Project Governance
- Develop Weekly Status Report
- Manage Project Work Plan and Associated Reporting
- Conduct Project Team Meetings
- Develop Issues Management Plan
- Issues / Risks log (tracker)
- Develop and Manage Project Control, Standards, and Procedures
- Create Deliverable Expectation Document for project deliverables
- Approve Deliverable Expectation Document
- Develop Content and Components for Requirements, Analysis & Design Sessions
- Schedule Requirements, Analysis & Design Sessions
- Coordinate Creation and Execution of Test Plans, Configuration Management Plants, Deployment Plans and Contingency Plans

Each of the deliverables named above is described in some detail, in terms of function, timing, and relationship to other deliverables and to project objectives. The communication plan for project management is extensive, tying deliverables to project milestones and identifying clearly where responsibility lies for delivery, as well as identifying specific state recipients (by role) for deliverables.

[17] NASPO, The Value of eProcurement/ERP Solutions. Case Studies

Overall Project Deliverables related directly to Project Management include:

- Project Management Plan
- Integrated Project Plan

These Project Deliverables are described in high-level language. They are clear, appropriate, and functionally related to the overall project approach.

7.3.2 TRAINING

The implementation vendor has supplied a sample training plan. Although a sample, this plan comprises a detailed response to Vermont-specific training needs and expectation.

The training approach employs multiple modes — classroom, webinar, online training, and multimedia including text manuals, videos, and "job aids" — and is tailored for various audiences, such as State Procurement specialists, Agency workers, and vendors. The general training scheme is a "train-the-trainer" educational structure and uses a well-designed "end-to-end" stepwise meta-curriculum of preparation, learning events, and on-the-job support. The plan is detailed in objectives, products, process, materials, and timing. The online components employ the third-party Articulate online training platform.

Deliverables include:

- Course Decks
    - PowerPoint slides forming the basis for classroom, webinar, and online training venues.
    - 11 Course decks are proposed for the VT deployment
- Training Manuals
    - These are created in Microsoft Word and are designed as supplemental materials
    - General there is one training manual per course; the exception is vendor enrollment, which comprises 6 manuals
    - 17 training manuals in total are proposed or the VT deployment
- Job Aids
    - Job Aids are short-form reference guides created in PowerPoint and addressing a particular procedure or process
    - 25 Job Aids are proposed for the VT deployment
- Videos
    - Videos are screen-recording captures of eProcurement procedures with a step by step approach
    - 7 Videos are proposed for the VT deployment
- Online Help
    - Online help is available on every page of the eProcurement user interface
    - Online help includes contextual help ("tool tips") and on-screen links to training manuals or job aids where appropriate

The plan delineates a detailed timeline, covering approximately 8 weeks of course materials development, overlapping with approximately 10 weeks of course delivery. Training delivery begins with State Procurement users and continues through to vendor training in several stages.

We are impressed especially with the vendor's extensive attention to training. The educational approach is very professional. It takes notice of the different needs of different audiences, identifies those audiences, sequences them, and provides curricula and training materials for a variety of audiences. The deliverables are clear, and they are explained in both qualitative and quantitative manner.

As mentioned elsewhere in this review, broad comprehensive adoption by all State Agencies is essential to achieving the objectives of this project. A comprehensive training plan — as this seems to be — increases greatly the likelihood of achieving that goal.

7.3.3 TESTING

The implementation vendor's test approach is described visually and narratively as an iterative process reflecting in general the agile-like sprint approach of the configuration process. Eight interdependent testing cycles are anticipated:

- Unit Testing
- Conference Room Pilot
- System Integration and Functional Testing
- Performance Testing
- Disaster Recovery Testing
- User Acceptance Testing (UAT — The State drives this process)
- Security Testing

The test process persists in various forms throughout the implementation process. All aspects of the system are tested either iteratively, and/or at specific points of delivery. Testing deliverables will include:

- Test Plan
    - Documents the details of the overall functional and non-functional test plan
- Test Cases and Scripts
    - These establish test scenarios that reflect the Requirements Traceability Matrix laid out by the State in the RFP process.
    - User stories are associated for each individual requirement
    - User acceptance testing (a State responsibility to perform) will be scripted as well
- Test results
    - The implementation vendor will provide the State with documented results of all testing, including:
        - Type of testing
        - Test case summary
        - Test results summary
        - Applicable and agreed to testing and defect metrics

- Supporting documents

All of these deliverables and activities are detailed in the proposed test plan in much greater detail than the summary here.

In all, the test plan, timing, and deliverables are extensive, appropriate to the scale of the project, and sufficiently reflective of State requirements, both functional and non-functional. The documentation will be appropriate and detailed. The State will have important responsibilities in various testing phases, including creating user test cases and conducting and reporting acceptance testing.

Our conversations with project principles and Agency Leads indicate that the appropriate individuals on the State side of the project are understanding of, and ready for, these responsibilities.

7.3.4 DESIGN

Design Deliverables include (descriptions are our own, but derived from vendor's text):

- Target operating model
  - Defines how the existing solution would need to be reconfigured to deliver the required (envisioned) future operating model. The vendor has built a preliminary model — this is a visual representation of the desired end state.
- Environment strategy
  - This defines the approach and plan for the project environments and how they are used during the eProcurement project.
- Data migration strategy
  - See Conversion, below.
- Test strategy
  - The projects approach to testing. See Testing, above.
- Integration Strategy
  - All approaches for integrating existing systems. This would include presumably VISION and STARS, as well as other identified systems.
- Interface functional specification
  - Describes functionality to be provided by interfaces in business and user terms.
  - Also defines validation of the same.
- Business process models
  - To simplify understanding of specific business activity flows
- Business and technical design documents
  - Key design principles, security points, assumptions, dependencies, and risks.
  - Business solution overview
  - Detailed technical interface design document(s)

These deliverables demonstrate that the implementation vendor is applying design best practices and viewing the State's requirements and needs as an interconnected whole. PMBOK principles are strong

on documentation, and these deliverables would seem to form a strong basis for configuration and deployment.

7.3.5 CONVERSION (IF APPLICABLE)

The implementation vendor will supply a data migration plan consisting of the following deliverables (as appropriate):

- Business and technical preparation procedures
- "Predecessors" for migrating specific data objects (e.g., legacy system shutdown or audit success)
- The needed data sequence for migration
- Timings for migration
- "Successors" to migrating specific data objects (e.g, this could be the user signing off on it)
- Number and type of resources necessary for the migration/load
- Contingency procedures in the event the process, or part of the process, fails

Data conversion will, of necessity, be a cooperative effort between State personnel, the implementation vendor, and the solution vendor. The State will be responsible for extracting the data from its current systems and any external third-party systems into a solution provider defined format, and for data cleansing activities. The implementation vendor will provide guidance to the State as to what data elements are essential and will be responsible for moving the data in the new solution (for non-manual transfers only).

Existing State data that will have to be imported into the new solution is in many forms: some in productivity applications such as spreadsheets, some in other office applications, some in databases (we are not here referring to data in the VISION or STARS systems, which will be interfaced, not moved). The State chief data officer has described in general terms the state of existing data and expresses confidence that most data conversions will be straightforward. Given the source applications, we think this is likely and reasonable.

7.3.6 IMPLEMENTATION PLANNING

The solution is highly configurable, meaning that functionality can be defined and implemented using in-application choices or switches, rather than through base code development. At the same time, the eProcurement requirements of the State will necessitate significant configuration. Adequate planning to ensure timely and logical configuration of the solution requires significant governance and project management tools and communication on the part of the vendor. We think the implementation vendor's description of these tools and communication are highly developed and sophisticated, appropriate to the scope and complexity of the project.

The implementation vendor employs a Project Charter that includes development of a Project Governance Framework. This framework, developed in close conjunction with the State project team during the implementation planning phase, defines and confirms the general outline, content, and level of detail for each deliverable and documents it in a Deliverable Expectation Document. Project Deliverables will be submitted to the State Project Manager and accompanied by project correspondence identifying deliverable, details, and date. Any changes will go through an agreed upon Change Control Process. The Project Schedule will identify the timeline position for each deliverable, as well as due dates. An Issues and Risks log, shared with the State, is maintained throughout the process. As described above, the Project Management Methodology is based on PMBOK principles and provides a Master Work Plan and Work Breakdown Structure (WBS). Details for each phase in the Master Work Plan are expanded before the beginning of the phase and will include task dependences.

The list of planning deliverables is extensive. Deliverables included (but are not limited to):

- Configuration workbooks / Documentation
    - Populated templates relating to
        - Specific configuration items, approach used, software tools required, and metrics to measure compliance
        - Processes to be used to assemble the components of a software release
- Interface Functional Specification (We also list this in Design, above)
    - Describes the functionality to be provided by interfaces in business and user terms
- Configuration Management Plan
    - Identifies and describes the overall policies and methods for configuration management activities to be used during the system lifecycle
        - Identifies changes mandated by code development or business requirements that could alter the application's operations
        - Mandate approval procedures for moving components between environments
        - Document problems associated with operational components of the application
- Deployment Plan
    - Guides the management team through system deployment
- A Project Progress Performance Metric Plan
    - Quality Metrics conforming to IEEE 1061, Standard for a Software Quality Metrics Methodology
- Requirements, Analysis and Design Session Schedules and Content

We think this set of deliverables assures a high likelihood of project success through careful alignment of State business requirements with the inherent capabilities of the solution. They also provide a good roadmap for creating implementation phase deliverables.

7.3.7 IMPLEMENTATION

The implementation vendor recommends that the solution be delivered in two distinct functional workstreams and two different go-lives. The two workstreams are 1) Sourcing & Bid Management, Contract Lifecycle Management, and Supplier Management, and 2) Procure to Pay, Catalog Management, Services Procurement and Advanced Data Analytics:[18]

Functional Release I Sourcing & Bid Management, Contract Life Cycle Management, Supplier Management – This workstream will address different supplier management processes covering supplier registration, onboarding and supplier performance management, (as well as category management, strategic sourcing, and contract lifecycle management processes as well as the associated reporting requirements). The specific Ivalua modules that will be implemented to enable this release will be:

- Supplier Repository
- Registration & Data Management
- Performance Evaluation
- Sourcing Projects, RFx, Auctions, and Bill & Materials
- Savings Tracking (optional)
- Procurement Project Management (will be covered in both workstreams)
- Contract Authoring & Lifecycle
- Contract Repository

Functional Release II – Procure to Pay, Catalog Management, Services Procurement and Advanced Data Analytics - This workstream will address the different buying channels covering requisitioning, ordering, approvals, receipting, invoicing, and payment processes as well as the associated reporting requirements. The specific Ivalua workstreams that will be implemented to enable this release will be:

- Purchase Reqs and Purchase Orders
- Budget Tracking
- Goods Receipts
- Items & Catalogs
- Analytics and Dashboard
- Spend Enrichment Workbench
- Services Procurement
- Invoicing: Invoices and Payments, Accruals Procurement, Invoicing and extended use of Purchasing Intelligence
- Purchasing Intelligence: Analytics and Dashboard, Procurement Project Management (will be covered in both workstreams)

The Sourcing & Bid Management, Contract Lifecycle Management, and Supplier Management functionality is envisioned to go-live first, and the remaining functionality will be deployed in a subsequent release, all over a sixteen month period (see timeline above). We think this construction

[18] KPMG LLC, BAFO Clarification Consolidated, PDF pg. 115

makes sense and will likely optimize State participation and acceptance of deliverables in a stepwise logical manner.

The integration of these workstreams with the above planning, integration, testing, and training deliverables is extensive, comprehensive, and conforming to best practices for project management. The State Project Manager and Organizational Change Manager will be key in aligning State project principles with the implementation as it moves forward. The plan as a whole is (appropriately) highly complex, and it is likely that State project principals who are not project professionals will only grasp in detail the documentation and tasks that concern them directly. The two State managers will need to perform a continuing educational role, and the project principals will need to trust the managers' leadership in apportioning tasks.

The following table shows the implementation vendor's milestones. The table was created at an earlier point in the proposal/negotiation process, so the target dates are no longer valid. However, they do show a sequence that coordinates with the timeline above.

Milestone	Approximate Date (assumes Feb 4, 2019 start)
Initiate Phase complete	3/4/19
Business Modeling Release 1 complete	3/18/19
Business Modeling Release 2 complete	8/6/19
Detail Requirements Release 1 complete	3/28/19
Detail Requirements Release 2 complete	8/23/19
Design Release 1 complete	6/5/19
Design Release 2 complete	11/5/19
Iterative Build Release 1 complete	8/5/19
Iterative Build Release 2 complete	1/6/20

System & Functional Test Release 1 complete	9/27/19
UAT Release 1 complete	11/20/19
System & Functional Test Release 2 complete	2/28/20
UAT Release 2 Complete	4/13/20
Release 1 Cutover and Deployment complete	12/23/19
Release 2 Cutover and Deployment complete	5/26/20
Release 1 On Site Support complete	2/10/20
Release 2 On Site Support complete	7/6/20

7.4 DOES THE STATE HAVE A RESOURCE LINED UP TO BE THE PROJECT MANAGER ON THE PROJECT? IF SO, DOES THIS PERSON POSSESS THE SKILLS AND EXPERIENCE TO BE SUCCESSFUL IN THIS ROLE IN YOUR JUDGEMENT? PLEASE EXPLAIN.

The Project Manager (PM) engaged for this project by the State is a well-qualified and experienced ADS PM. We discussed the current status of the project with the PM and found the PM to be well capable of managing the project, with a clear and consistent vision for leadership, and an understanding of the strengths and weaknesses of the project team, as well as an understanding of the likely risks, challenges, and mitigations.

In assessing the state of the SharePoint document repository for the project, we found that, in general, good records and documentation of the project thus far have been kept. There are a few gaps, mostly due to the procurement phase of the project progressing beyond the need for particular documentation due to changing needs. All critical records are there and apparently complete. We are confident that the project manager will continue to create and maintain project documentation and lead PMBOK-aligned management processes and facilitate communication.

Additional Comments on Implementation Plan

none

8. COST BENEFIT ANALYSIS

8.1 ANALYSIS DESCRIPTION:

Our calculation of tangible benefits is described in **8.4,** *below*. Intangible benefits are significant, and measures of success are shown in the table in **8.5,** *below.*

Tangible benefit analysis is based on comparison to estimated results from Virginia; intangible analysis is based on interviews with project principals and our understanding of metrics and historical data available to the State.

8.2 ASSUMPTIONS:

- That approximate annual Vermont total procurement spend of $1 billion
- That figures reported by Virginia are accurate
- That State is able to collect and organize success metric data throughout the project once implementation is begun
- That State's current operating costs estimate calculation is reasonably accurate

8.3 FUNDING:

Provide the funding source(s). If multiple sources, indicate the percentage of each source for both Acquisition Costs and on-going Operational costs over the duration of the system/service lifecycle.

All funding for this project comes from State funds. No federal grants or funds are used. The eProcurement project is not envisioned as a self-funded system. (i.e., unlike several other states which fund eProcurement systems through nominal agency and vendor fees)

8.4 TANGIBLE COSTS & BENEFITS:

Provide a list and description of the tangible benefits of this project. Tangible benefits include specific dollar value that can be measured (examples include a reduction in expenses or reducing inventory, with supporting details).

Cost savings as a proportion of total procurement spend: **Potentially $4.2 million annually**

Most eProcurement deployments by governments anticipate savings in both total procurement spend and administrative overhead. Where figures are available, the savings tend to be significantly greater in

spend savings than in administrative overhead savings.[19] In Vermont's case, we found that the currently employed "paper-based" system is dispersed among agencies in such a way as to make estimates of current administrative overhead specifically related to procurement difficult to quantify sufficiently. (See the following identified benefit, for example.)

It is reasonable to expect tangible savings in total annual procurement spend, as comparable deployments in other States reliably achieve some measure of these savings.[20] To estimate a figure, we consulted first with NASPO to identify a State with characteristics (of the eProcurement deployment) comparable with Vermont. They suggested Virginia, whose EVa system was initially launched in 2001. Virginia deploys EVa across all of state government and includes educational institutions and local government entities. In these first two characteristics, it is similar to Vermont's objectives. From existing case studies, full deployment (i.e., all State agencies, not just a selection) is key to realizing tangible cost savings.[21] While Virginia's system is mature and has been in place a long period of time, we think Vermont could achieve comprehensive use within a few years at most.

Virginia measures cost savings combining savings in Sourcing, Ordering, and Vendor Management. In FY2016, Virginia estimates total net savings (= savings – operating cost) to the Commonwealth of $26.86 million and issued nearly 700,000 purchase orders valued at $6.36 billion, or 0.42% of spend. Vermont's annual spend is approximately $1 billion. A 0.42% savings would be about $4.2 million.

Clearly, this is a rough estimate, and many factors will go into the actual savings realized, including the existing vendor mix, new vendors recruited, the efficiency of the State in encouraging and stewarding use by both Agencies and vendors, etc. There could be a fairly wide range of savings. However, we think it is reasonable to expect some savings of this sort, while prudently awaiting the reception of the system as a whole.

***Possible* cost savings over lifecycle, compared to current procurement costs:**

$ 19,484,866 ($1,948,488 annualized)

This tangible benefit calculation is based on the calculation of current operating costs developed for the original IT-ABC form. This calculation was as follows:

> *Numbers based on average req-to-order costs (estimated at $56 per), total number of PO's, employee reimbursement and checks requests per year were 39,368 for FY2013. Also PCard invoices/check requests totaled 30,627 for FY2013 and average cost (estimated at $34/per).*

[19] NASPO Research Brief

[20] *Ibid.*

[21] Seivert, email.

This calculation results in an estimate of current operating costs of $3,261,046. **Impact Analysis on Net Operating Costs, Section 9,** *below*, uses this figure against proposed solution costs to show a cost savings of **$19,484,866** over the 10 year lifecycle of the project.

For reasons related to the difficulty of collecting and aggregating current procurement operations costs across State government, as mentioned above, this figure was the best the State could provide to us. (The author of the original formulation above is no longer available.) We therefore think this result is somewhat soft, although some real savings are very likely. We include it here for completeness, but we think the total spend savings above are more likely to be measurable.

8.5 INTANGIBLE COSTS & BENEFITS:

Provide a list and description of the intangible benefits of this project. Intangible benefits include cost avoidance, the value of benefits provided to other programs, the value of improved decision making, public benefit, and other factors that become known during the process of analysis. Intangible benefits must include a statement of the methodology or justification used to determine the value of the intangible benefit.

Various project documents (IT-ABC form, Charter, RFP, EA Vision) have listings of objectives/benefits expected from the eProcurement project.

Objective/Benefit	Potential Measures	Reviewer's Comments
Implement an easy-to-use eProcurement Solution Software-as-a- Service (SaaS)	• Track number of POs, Solicitations and Contracts processed within the eProcurement Solution vs. outside the system • Track number of users utilizing the system vs. number identified in the RFP to be set up	**This seems reasonable as long as "outside the system" procurements are flagged and logged**

Objective/Benefit	Potential Measures	Reviewer's Comments
Drive greater process efficiencies throughout the State's procurement, contracting, and purchasing processes	Comparing to pre-eProcurement processes/practices: • Transactional: Track process cycle time from Requisition submission to PO creation • Transactional: Track average approval time for Requisition • Transactional: Track average cycle time from Solicitation posting to award, for specific dollar ranges (e.g. Solicitations valued between $100K-$500K or some other grouping that tries to group similar complexity of solicitations)	**Some historical data may not be available for comparison. However, a well-constructed sampling approach might be used, if designed early enough.**
Eliminate redundant software applications in use	• Track annual licensing costs for software tools/systems that are retired with adoption of eProcurement solution	**This is do-able. Discussions with IT team indicate these systems would be identified as implementation and use progresses, so we recommend that the project team explicitly tracks this data in a project document**
Implement Spend analytics	• Track total state spend on goods/services by category, etc.	**Reasonable**
Integrate and interface with the current State financial management system (VISION), related websites and other systems/applications (e.g. VTRANS' STARS financial management system)	• Track number of PO transactions integrated into VISION vs. number that are manually created in VISION	**Reasonable**

Objective/Benefit	Potential Measures	Reviewer's Comments
Reduce manual, paper-based processes and process cycle times	• Track number of POs, Solicitations and Contracts processed within the eProcurement Solution vs. outside the system • Track process cycle time from Requisition submission to PO creation	**Reasonable**
Improve Agency and Department/Vendor interactions with use of the Solution	• Track number of Vendors registered in eProcurement vs. number registered in VISION • Track average number of Vendors invited to bid on Solicitations in eProcurement • Track average number of Vendors submitting bid/response to Solicitations in eProcurement	**Reasonable. The second 2 points would need comparison data**.

8.6 COSTS VS. BENEFITS:

Do the benefits of this project (consider both tangible and intangible) outweigh the costs in your opinion? Please elaborate on your response.

Yes. This project was ambitious and visionary from its inception. The strong level of support it received from sponsorship and leadership, the careful and detailed work by the project team, and the experienced advice from NASPO and others contribute strongly to the likelihood of significant benefits, both tangible and intangible. There is some question for us as to whether the intangible benefits will be uniformly measured, and we identify this as a risk (**_RISK_ID# _R2_**). The problem, as we see it, is that current procurement costs (specifically *as* procurement process costs) have not been captured historically. We are not here criticizing the State's recording keeping or suggesting something has been missed. The fact is that, in a small state like Vermont, prior to the adoption of a comprehensive procurement system such as the one proposed, procurement activities are likely to be widely dispersed and conducted in some of the smaller entities by people who have multi-faceted jobs, with procurement just one part of the job. It is possible to analyze "on the ground" processes to find out how they are

being done, so that they can be modeled to define business needs for an eProcurement process, but another matter to determine with any certainty how much of which person's job was "procurement," and to do this uniformly across government. In the table above, we attempt to identify what objectives can be demonstrated to have been achieved, based on data that would be available.

In response to this risk, the State says, in part, "BGS OPC has a fair amount of metrics, but it is only specific to the contracts that go through their office and doesn't represent the State as a whole." We agree. They also state, "here are some data points regarding procurement metrics that BGS OPC has that can be used as baseline data that will be metrics to measure. Part of the goals of implementing this system is so that there are more metrics to be used in the future regarding Procurement." We agree emphatically. In the table above, we have attempted to point out some areas where this is more likely to be quantitatively established, in our opinion.

However, and we emphasize this point, *whether or not success is able to be quantified*, it seems likely to occur, and should be apparent anecdotally. The question is primarily one of *demonstrating* success through quantitative measures where possible.

And **we remind the reader that the tangible benefits, especially possible savings in total procurement spend, are both likely and quantifiable.**

We have no doubt that the benefits of this project far outweigh the costs.

8.7 IT ABC FORM REVIEW:

Review the IT ABC form (Business Case/Cost Analysis) created by the Business for this project. Is the information consistent with your independent review and analysis? If not, please describe.

The project has evolved considerably since the IT-ABC form was approved. Most of the differences lie in cost estimates. Annual operating costs in the IT-ABC for the proposed project were projected at $792,930, compared with the now established annual operating costs of $598,000, 26% less expensive. Implementation costs were estimated at $1,941,737 compared with proposed project implementation costs of $7,318,000. Even when subtracting the first year operational cost of $598,000, this is almost 3-1/2 times larger. We suspect the differences are due to the early level of project cost understandings at the IT-ABC stage. The objectives of the project remain the same. Current operating costs as calculated in the IT-ABC form the basis for current operating cost calculations in the present Independent Review.

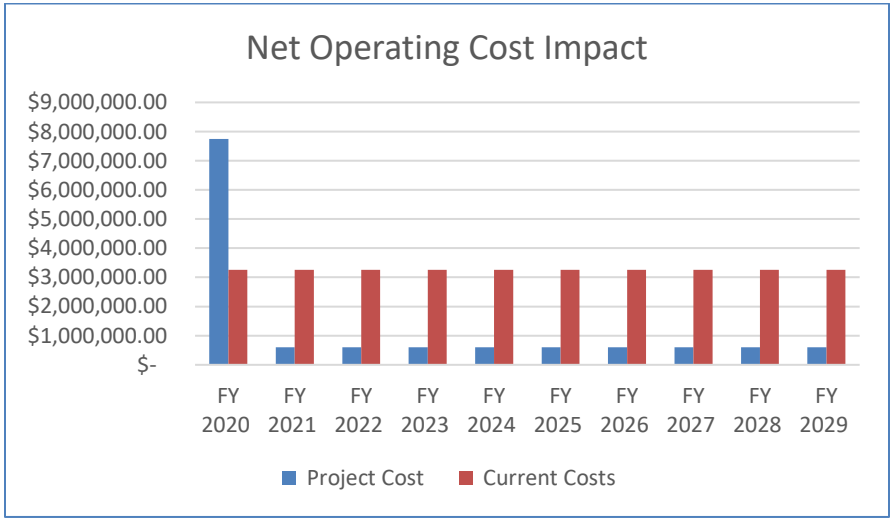
Additional Comments on the Cost Benefit Analysis:

none

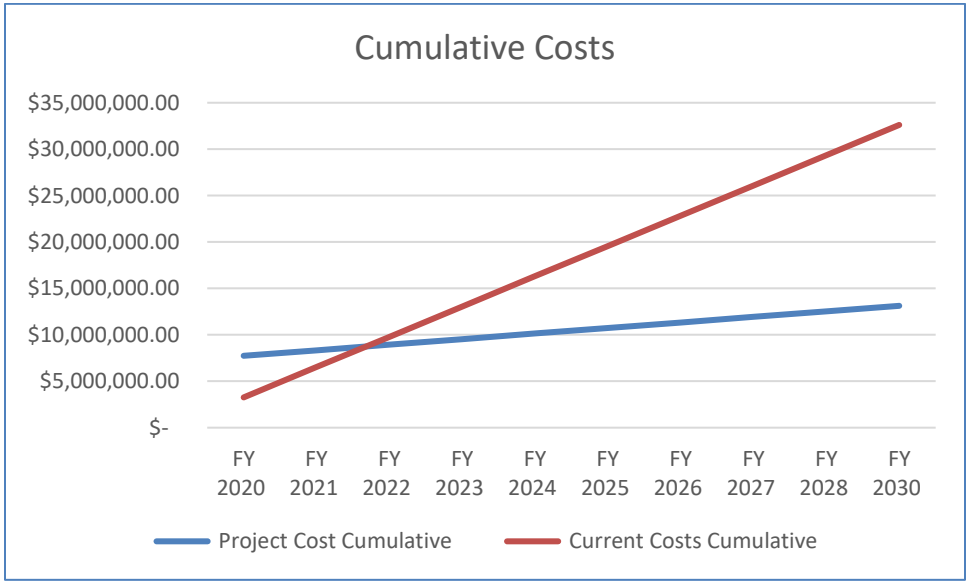
9. IMPACT ANALYSIS ON NET OPERATING COSTS

9.1 INSERT A TABLE TO ILLUSTRATE THE NET OPERATING COST IMPACT.

	Initial Implementation	O&M	O&M	O&M	O&M	O&M	O&M	O&M	O&M	O&M
	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Project Cost	$7,743,594.35	$598,000.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00	$598,000.00
Current Costs	$3,261,046.00	$3,261,046.00	3,261,046.00	3,261,046.00	$3,261,046.00	$3,261,046.00	$3,261,046.00	$3,261,046.00	$3,261,046.00	$3,261,046.00



	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2030
Project Cost Cumulative	$7,743,594.35	$8,341,594.35	$8,939,594.35	$9,537,594.35	$10,135,594.35	$10,733,594.35	$11,331,594.35	$11,929,594.35	$12,527,594.35	$13,125,594.35
Current Costs Cumulative	$3,261,046.00	$6,522,092.00	$9,783,138.00	$13,044,184.00	$16,305,230.00	$19,566,276.00	$22,827,322.00	$26,088,368.00	$29,349,414.00	$32,610,460.00
Cumulative Cost Savings	$(4,482,548.35)	$(1,819,502.35)	$843,543.65	$3,506,589.65	$6,169,635.65	$8,832,681.65	$11,495,727.65	$14,158,773.65	$16,821,819.65	$19,484,865.65



Cumulative Cost Savings over 10 years of project compared to current costs = $19,484,865.65.

Breakeven point is FY 2022

9.2 PROVIDE A NARRATIVE SUMMARY OF THE ANALYSIS CONDUCTED AND INCLUDE A LIST OF ANY ASSUMPTIONS.

For current costs, we used the same figure as in the **Cost/Benefit Analysis**, *above*, the calculation of current operating costs developed for the original IT-ABC form. This calculation was as follows:

> *Numbers based on average req-to-order costs (estimated at $56 per), total number of PO's, employee reimbursement and checks requests per year were 39,368 for FY2013. Also PCard invoices/check requests totaled 30,627 for FY2013 and average cost (estimated at $34/per).*

This calculation results in an estimate of current annual operating costs of $3,261,046.

As explained above, this figure is the best the State could provide to us, given the difficulty in estimating procurement-only costs in the widely dispersed procurement operations in the current, largely manual, environment. Our chief assumption here, therefore, is that the figure given represents actual current costs. In the event, it will be difficult to measure.

Our analysis shows that, after a cost-intensive period of implementation (approximately $7.7 million), annual Operations & Maintenance (O&M) costs will be $595,000, well below the estimated cost of current procurement operations across State government.

9.3 EXPLAIN ANY NET OPERATING INCREASES THAT WILL BE COVERED BY FEDERAL FUNDING. WILL THIS FUNDING COVER THE ENTIRE LIFECYCLE? IF NOT, PLEASE PROVIDE THE BREAKOUTS BY YEAR.

N/A

9.4 WHAT IS THE BREAK-EVEN POINT FOR THIS IT ACTIVITY (CONSIDERING IMPLEMENTATION AND ON-GOING OPERATING COSTS)

- Cumulative Cost Savings over 10 years of project compared to current costs = $19,484,866.
- Breakeven point is FY 2022

See the Cumulative Costs table on the previous page for a graphic representation.

10. RISK ASSESSMENT & RISK REGISTER

RISK REGISTER

The following table explains the Risk Register components:

Risk ID:	Identification number assigned to risk or issue.
Risk Rating:	An assessment of risk significance, based on multiplication of **(probability X impact ratings)** (*see below*). **1-6 = low** **7-44 = moderate** **45-90 high** See table below
Probability:	Assessment of likelihood of risk occurring, scale of **1,3,5,7, or 9**, from least to most likely
Impact:	Assessment of severity of negative effect, scale of **1,3,5,7, or 10**, from least to most severe
Finding:	Review finding which led to identifying a risk
Risk Of:	Nature of the risk
Risk domains:	What may be impacted, should the risk occur
Reviewer's recommendation	Decision to *avoid*, *mitigate*, or *accept* risk Detailed description of response to risk, in order to accomplish decision
State's response	State's planned action in light of recommendation
Reviewer's Assessment:	Reviewer's evaluation of the State's planned response

Risk Rating Matrix			IMPACT				
			Trivial	Minor	Moderate	Major	Extreme
			1	3	5	7	10
LIKELIHOOD	Rare	1	1	3	5	7	10
	Unlikely	3	3	9	15	21	30
	Moderate	5	5	15	25	35	50
	Likely	7	7	21	35	49	70
	Very Likely	9	9	27	45	63	90

ADDITIONAL COMMENTS ON RISK

The Risk IDs in the tables below may have gaps in sequence, to maintain consistency with earlier drafts.

	Rating:	**49**
Risk ID: R2	Likelihood:	**7**
	Impact:	**7**
Finding:	Project has defined several quantitative metrics to measure eventual project benefit and/or success, but baseline data on some of these metrics have not been collected or compiled. If not established before implementation, baseline data could be lost if contained in retired systems.	
Risk Of:	Loss of ability to measure, establish, and celebrate project success.	
Risk To:	Success measurement, State reputation, cost-benefit analysis	
Reviewer's recommendation	Identify and collect baseline data before implementation rollout	
State's response	There are some data points regarding procurement metrics that BGS OPC has that can be used as baseline data that will be metrics to measure. Part of the goals of implementing this system is so that there are more metrics to be used in the future regarding Procurement. BGS OPC has a fair amount of metrics, but it is only specific to the contracts that go through their office and doesn't represent the State as a whole.	

Risk ID: R3	Rating: Likelihood: Impact:	**35** **5** **7**
Finding:	Internal State network connectivity problems are frequent and "pervasive," for reasons that are not completely defined.	
Risk Of:	Risk that such problems either delay procurement processes or force/encourage users to employ manual methods outside the system. Could also affect integration (hybrid/outside)	
Risk To:	Connectivity	
Reviewer's recommendation	Integrate State network/connectivity assessment and recommendations for remediation as part of the current project	
State's response	The State is addressing this issue by a separate project of network redesign and upgrade which is now underway and ongoing.	
Reviewer's comment	We agree with the State's approach.	

Risk ID: R4	Rating: Likelihood: Impact:	**35** **5** **7**
Finding:	A variety of data movement methods are employed throughout State government. Some of these are deprecated methods, such as batch, point-to-point, hard-coded IP addresses in configuration files.	
Risk Of:	Same risk as above, plus data per-se	
Risk To:	Connectivity	
Reviewer's recommendation	Throughout development, always prefer best practices, such as RESTful etc., and when not practical in the short term, make a clear path for long term.	
State's response	Agree	

	Rating:	**3**
Risk ID: R5	Likelihood:	**1**
	Impact:	**3**
Finding:	There is some uncertainty in the team about when first functionality will be rolled out. Some potential State users have been told/expecting 6 months, but that is not realistic. Probably one year?	
Risk Of:	Loss of enthusiasm and focus during critical implementation periods.	
Risk To:	Implementation	
Reviewer's recommendation	Establish and promulgate single project "line" on rollout timing	
State's response	Agree. There have been defined two rollout periods for this implementation This information will be published as soon as the contracted is negotiated and this information is defined.	

Risk ID: R6	Rating: Likelihood: Impact:	**21** **3** **7**
Finding:	Some very small or geographically isolated vendors may face technological challenges (broadband / cell availability, web browsing device) discouraging or preventing them from using the system.	
Risk Of:	If solution is not fully adoptable, State users could fall back on existing or manual methods of procurement to "backfill."	
Risk To:	Adoption, Implementation	
Reviewer's recommendation	Explicitly plan and build-in small/challenged vendor onboarding	
State's response	Agree	

	Rating:	**3**
Risk ID: R7	Likelihood:	**1**
	Impact:	**3**
Finding:	Agency Leads, while very enthusiastic and optimistic about the project, express some unclarity on the amount of Agency human resources needed for the project during implementation period. They heard an early estimate of 1 FTE / Agency, but this has not been updated. Project principals have not expressed to us any need for dedicated personnel beyond those already identified (i.e., PM, OCM, ADS resources)	
Risk Of:	Project implementation might be under sourced at Agency/Dept level.	
Risk To:	Implementation	
Reviewer's recommendation	Review and assess Agency-level resource needs before implementation gets underway.	
State's response	Agree	

Risk ID: R8	Rating: Likelihood: Impact:	**3** **1** **3**
Finding:	Vendor's response to Section 4. Security NFR S17 (original proposal PDF p. 72) is insufficiently quantitative although qualitatively adequate	
Risk Of:	State receiving insufficient assurances of Risk Assessment timing and outcomes	
Risk To:	Security	
Reviewer's recommendation	Agree with SOV response	
State's response	State should ask for clarification of the methodology that KPMG will use for risk assessment, not simply risk identification.	

	Rating:	**3**
Risk ID: R9	Likelihood:	**1**
	Impact:	**3**
Finding:	Vendor's response to Section 5. Data Compliance standards requirements (original proposal p. 74) does not identify a specific timetable or roadmap for coming into compliance in all sections.	
Risk Of:	Non-compliance with State/Fed mandated requirements	
Risk To:	Security	
Reviewer's recommendation	Require sufficient detail on compliance timing from vendor	
State's response	Agree. State notes "concerns about the data compliance roadmaps and how we note that we need a solidified timeline with dates and milestones of when they believe that they will be compliant. If their compliance will be in effect prior to "go live" then the risk is lower. If the dates are post "go live" the contract must address the vendor's obligation to meet the agreed upon dates."	

Risk ID: R10	Rating: Likelihood: Impact:	**9** **3** **3**
Finding:	According to the State security analyst's assessment, some State Vendor enablement & management requirements (original proposal PDF p. 353 and onward) require a level of integration with Fed Tax information that might result in requiring an IRS audit	
Risk Of:	Unanticipated additional compliance requirements and assessment	
Risk To:	Security	
Reviewer's recommendation	Consider whether these requirements should be reformulated (in part)	
State's response	List out the requirements that pertain to this and get a response from the vendor whether they can meet them or not.	

	Rating:	**10**
Risk ID: R14	Likelihood:	**1**
	Impact:	**10**
Finding:	According to NASPO research, "broad adoption is the only driver for achieving the substantial benefits of an eProcurement system and business practice." The State has focused considerable effort on ensuring broad adoption; but falling short of this goal will be a risk until the target adoption is completed.	
Risk Of:	Risk that users to continue to employ manual methods or other deprecated processes outside the system, resulting in projected benefits failing to materialize.	
Risk To:	Success measurement, State reputation, ROI	
Reviewer's recommendation	1. Track user engagement by number of users at all levels of procurement, including buyers and approvers. 2. Track transaction quantity (not only dollars)	
State's response	There will be Policy put in place, likely updates to Bulletin 3.5, as well as notification from the Agency of Administration that makes it clear the eProcurement system will be the system of record and must be used by all State Agencies and Departments.	
	According to NASPO research, "broad adoption is the only driver for achieving the substantial benefits of an eProcurement system and business practice." The State has focused considerable effort on ensuring broad adoption; but falling short of this goal will be a risk until the target adoption is completed.	

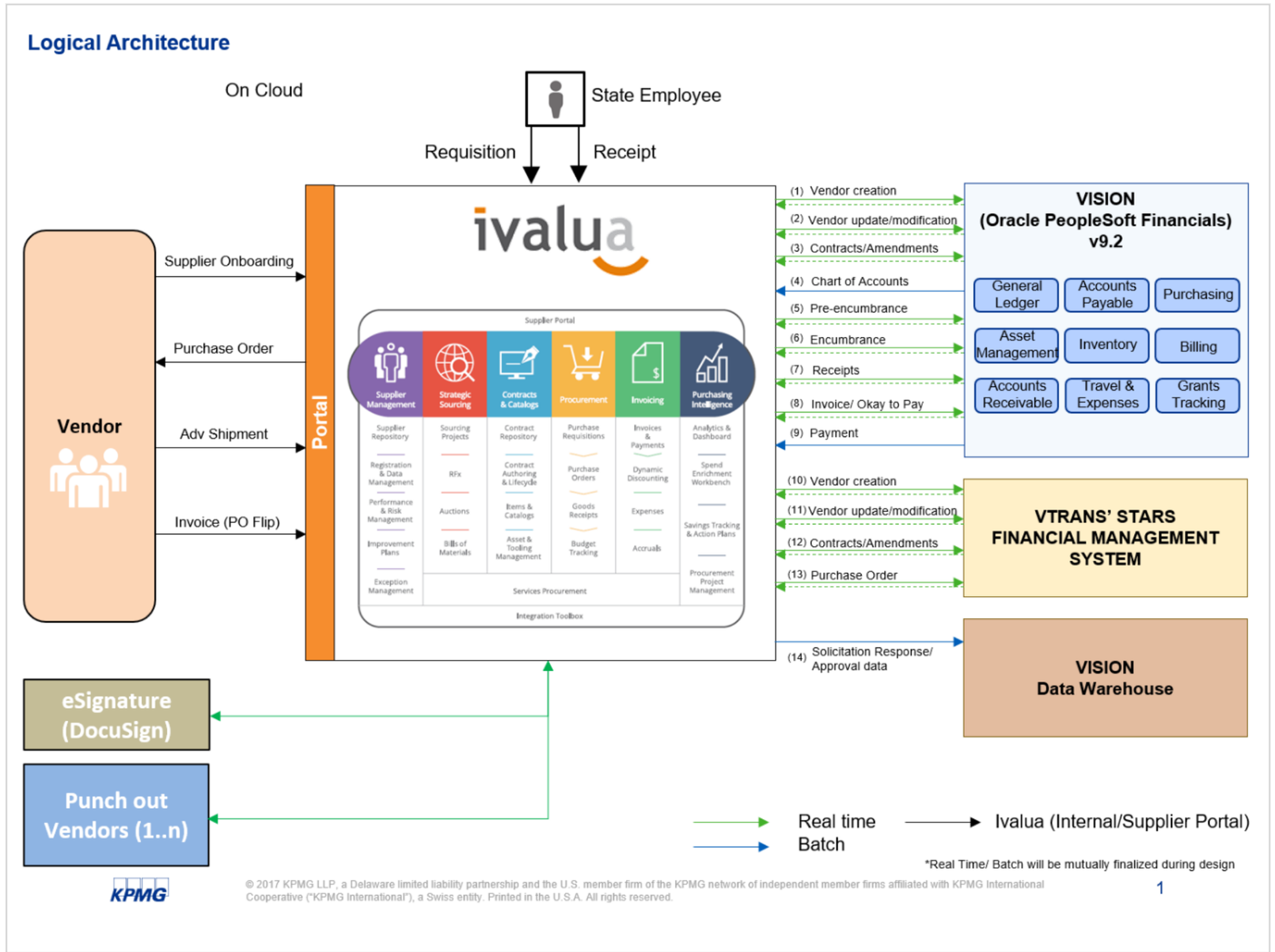
11. ATTACHMENTS

Attachment 1 – Illustration of System Integration

Attachment 2 – Risk & Issues Register Summary

Attachment 3 – Cost Spreadsheet

ATTACHMENT 1 – ILLUSTRATION OF SYSTEM INTEGRATION



ATTACHMENT 2 - EPROCUREMENT INDEPENDENT REVIEW -- Risk and Issues Register -- version 5.0.a -- 2019 - September 19 -- Paul E. Garstki, JD -- Paul Garstki Consulting

RISKS

What is the finding that leads to identifying a risk? (This is a highly condensed version that is explained more fully in the report narrative)

What are the risks implied by the finding?

What aspects of the project are at risk if the risk(s) are realized?

What is the Independent Reviewer recommending?

What is the State's response to the recommendation(s) (e.g., agree, or alternative risk response.)

1,3,5,7, or 9

1,3,5,7, or10

1-6 = low
7-44 = moderate
45-90 high

Note: Risk ID # list may have gaps, in order to maintain consistency with earlier drafts

Risk #	Finding	risk of	risk domains	Reviewer Recommendation	SOV response	likelihood 1-9	impact 1-10	total rating
R2	Project has defined several quantitative metrics to measure eventual project benefit and/or success, but baseline data on some of these metrics have not been collected or compiled. If not established before implementation, baseline data could be lost if contained in retired systems.	Loss of ability to measure, establish, and celebrate project success.	Success measurement, State reputation, cost-benefit analysis	Identify and collect baseline data before implementation rollout	There are some data points regarding procurement metrics that BGS OPC has that can be used as baseline data that will be metrics to measure. Part of the goals of implementing this system is so that there are more metrics to be used in the future regarding Procurement. BGS OPC has a fair amount of metrics, but it is only specific to the contracts that go through their office and doesn't represent the State as a whole.	**7**	**7**	**49**
R3	Internal State network connectivity problems are frequent and “pervasive,” for reasons that are not completely defined.	Risk that such problems either delay procurement processes or force/encourage users to employ manual methods outside the system. Could also affect integration (hybrid/outside)	Connectivity	Integrate State network/connectivity assessment and recommendations for remediation as part of the current project	The teams does not agree with making the remediation plan for this a part of the eProcurement project. The State is addressing this issue by a separate project of network redesign and upgrade which is now underway and ongoing. *Note: reviewer agrees with this approach*	**5**	**7**	**35**
R4	A variety of data movement methods are employed throughout State government. Some of these are deprecated methods, such as batch, point-to-point, hard-coded IP addresses in configuration files.	Same risk as above, plus data per-se	Connectivity	Throughout development, always prefer best practices, such as RESTful etc., and when not practical in the short term, make a clear path for long term.	Agree	**5**	**7**	**35**
R5	There is some uncertainty in the team about when first functionality will be rolled out. Some potential State users have been told/expecting 6 months, but that is not realistic. Probably one year?	Loss of enthusiasm and focus during critial implementation periods.	Implementation	Establish and promulgate single project "line" on rollout timing	Agree. There have been defined two rollout periods for this implementation This information will be published as soon as the contracted is negotiated and this information is defined.	**1**	**3**	**3**
R6	Some very small or geographically isolated vendors may face technological challenges (broadband / cell availability, web browsing device) discouraging or preventing them from using the system.	If solution is not fully adoptable, State users could fall back on existing or manual methods of procurement to "backfill."	Adoption, Implementation	Explicitly plan and build-in small/challenged vendor onboarding	Agree	**3**	**7**	**21**
R7	Agency Leads, while very enthusiastic and optimistic about the project, express some unclarity on the amount of Agency human resources needed for the project during implementation period. They heard an early estimate of 1 FTE / Agency but this has not been updated. Project principals have not expressed to us any need for dedicated personnel beyond those already identified (i.e., PM, OCM, ADS resources)	Project implementation might be undersourced at Agency/Dept level.	Implementation	Review and assess Agency-level resource needs before implementation gets underway.	Agree	**1**	**3**	**3**
R8	Vendor's response to Section 4. Security NFR S17 (orignal proposal PDF p. 72) is insufficiently quantitative although qualitatively adequate	State receiving insufficient assurances of Risk Assement timing and outcomes	Security	Agree with SOV response	State should ask for clarification of the methodology that KPMG will use for risk assessment, not simply risk identification.	**1**	**3**	**3**
R9	Vendor's response to Section 5. Data Compliance standards requirements (original proposal p. 74) does not identify a specific timetable or roadmap for coming into compliance in all secitons.	Non-compliance with State/Fed mandated requirements	Security	Require sufficient detail on compliance timing from vendor	Agree. State notes "concerns about the data compliance roadmaps and how we note that we need a solidified timeline with dates and milestones of when they believe that they will be compliant. If their compliance will be in effect prior to “go live” then the risk is lower. If the dates are post “go live” the contract must address the vendor’s obligation to meet the agreed upon dates."	**1**	**3**	**3**
R10	According to the State security analyst's assessment, some State Vendor enablement & management requirements (original proposal PDF p. 353 and onward) require a level of inteegration with Fed Tax information that might result in requiring an IRS Safeguards audit	Unanticipated additional compliance requirements and assessment	Security	Consider whether these requirements should be reformulated (in part)	List out the requirements that pertain to this and get a response from the vendor whether they can meet them or not.	**3**	**3**	**9**
R14	According to NASPO research, "broad adoption is the only driver for achieving the substantial benefits of an eProcurement system and business practice." The State has focused considerable effort on ensuring broad adoption; but falling short of this goal will be a risk until the target adoption is completed.	Risk that users to continue to employ manual methods or other deprecated processes outside the system, resulting in projected benefits failing to materialize.	Success measurement, State reputation, ROI	1. Track user engagement by number of users at all levels of procurement, including buyers and approvers. 2. Track transaction quantity (not only dollars)	There will be Policy put in place, likely updates to Bullentin 3.5, as well as notification from the Agecny of Administation that makes it clear the eProcurement system will be the system of record and must be used by all State Agencies and Departments.	**1**	**10**	**10**

Attachment 3: eProcurement Cost Spreadsheet ver. 3.0

Project Name:			eProcurement										
Description	**Qty**	**Unit Price**	**Initial Implementation**	**Maintenance**	**Maintenance**	**Maintenance**	**Maintenance**	**Maintenance**	**Maintenance**	**Maintenance**	**Maintenance**	**Refresh & Maintenance**	**Total**
Fiscal Year			**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	
Hardware													
Server Hardware													$ -
Network Upgrades													$ -
Desktop Hardware													$ -
Other													$ -
Hardware Total			**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Software													
Product License[1]			$ 595,000.00	$ 595,000.00	$ 595,000.00	$ 595,000.00	$ 595,000.00	$ 595,000.00	$ 595,000.00	$ 595,000.00	$ 595,000.00	$ 595,000.00	$ 5,950,000.00
Product Per-User Charges													$ -
Database													$ -
Operating System Software													$ -
Additional Server Software													$ -
Additional Network Software													$ -
Software Escrow			$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 30,000.00
Software Total			**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 5,980,000.00**
Consulting													
Third-Party - Technical													$ -
Third-Party - Business													$ -
Deployment													$ -
Upgrade													
Independent Review			$ 17,769.00										$ 17,769.00
Consulting Total			**$ 17,769.00**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 17,769.00**
Training													
Training Total ("Train the trainer")[2]			$ 663,000.00										$ 663,000.00
Other													$ -
Training Total			**$ 663,000.00**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 663,000.00**
Implementation Services													
"Staffing"													
Vendor Management, Sourcing and Contract Management			$ 1,567,280.00										$ 1,567,280.00
Purchase-to-Pay			$ 1,441,177.00										$ 1,441,177.00
Integration			$ 525,752.00										$ 525,752.00
"Services"[3]													
Initiation			$ 246,836.00										$ 246,836.00
Project Management			$ 1,261,805.00										$ 1,261,805.00
OCM			$ 637,000.00										$ 637,000.00
Catalog Services			$ 259,534.00										$ 259,534.00
Help Desk			$ 113,616.00										$ 113,616.00
Termination / Transition			$ 4,000.00										$ 4,000.00
Implementation Services Total			**$ 6,057,000.00**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 6,057,000.00**
Personnel - Additional													
ADS Procurement/Planning[4]			$ 87,159.00										$ 87,159.00
ADS Project Manager[5]			$ 216,666.35	$ 28,888.85									$ 245,555.20
Organizational Change Mgr[6]			$ 104,000.00	$ 52,000.00									$ 156,000.00
Personnel - Additional Total			**$ 407,825.35**		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 407,825.35**
Grand Total			**$ 7,743,594.35**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 598,000.00**	**$ 13,125,594.35**
vendor implem. Only			$ 6,723,000.00										

NOTES / ASSUMPTIONS:

Notes:
1) All-inclusive "subscription" charge; see contract for details
2) Provided by vendor. Included in vendor's implementation offer (KPMG)
3) "Training Total" is moved to Training category, above
4) Re: email: Paid to date as of May 20, 2019
5) Re: email: .8 FTE X $306,944 for fully loaded for 17 months (April 1 to Aug 31)