Vermont Enterprise Architecture Framework (VEAF)

Service Oriented Architecture (SOA) v2.0

Abridged Strategy

Level 0

EA APPROVALS

EA Approving Authority:

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REVISION HISTORY

Version	Date	Organization/Point of Contact	Description of Changes
1	7/27/2015	S. Loftus, C. Bradley	Initial Draft – Document Outline Refactoring the SoV SOA strategy

Review History

Version	Date	Organization/Point of Contact	Description of Changes
1	9/21/2015	CTO, John P. Hunt	Draft Approval for Discussion

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1. SERVICE ORIENTED ARCHITECTURE (SOA) EXECUTIVE OVERVIEW

Document Purpose - The purpose of this document is to present a high-level overview of SOA, how it fits within the current suite of applications, and how it applies to future State strategies.

Audience – The intended audience of this document is SoV Business Executives, IT and Business Architects, and Business Analysts.

1.1. SOA Purpose

Applications developed using a SOA framework provide common, loosely coupled, services that can be leveraged and reused across the enterprise regardless of business process or practice. Typically, this begins by using services that originate from legacy systems that already exist within the enterprise. New applications consume the output of current systems; future applications are able to eventually begin to become autonomous entities, providing services that do not depend on, and can eventually replace legacy systems.

SOA is an architecture design pattern based on discrete pieces of software providing application functionality to other applications. As a component of the State of Vermont's Enterprise Architecture Framework (VEAF) strategy, SOA enables the implementation of agile business practices that emphasize interoperability. Interoperability is the ability of an application to provide services to other applications without special effort. Applications developed for SOA can be easily inserted into the existing framework, this then reduces development time and removes the need to modify existing systems to work with new systems.

SOA allows for the construction of business-focused systems made up of interoperable applications that provide services that can be leveraged throughout the Enterprise; by facilitating the creation of modular business solutions made up of reusable components, SOA avoids the need for complex coding efforts to deliver already existing capabilities. Eventually, this will lead to a more agile enterprise that can respond rapidly to changing market and regulatory demands.

A SOA based solution is critical for the State's Enterprise Roadmap, as it allows for:

- Rapid Deployment of applications

- The transition to a responsive, flexible, and extensible infrastructure

- The ability to support cross functional and divisional processes

- An enterprise-view of business services

- Standardization of processes & technologies

1.2. State of Vermont Direction

The alignment of both DII's and the Governor's Priorities is an important step towards having business drive the direction of IT. This alignment is shown in Figure 1 which depicts the alignment of the governor's and DII's priorities.
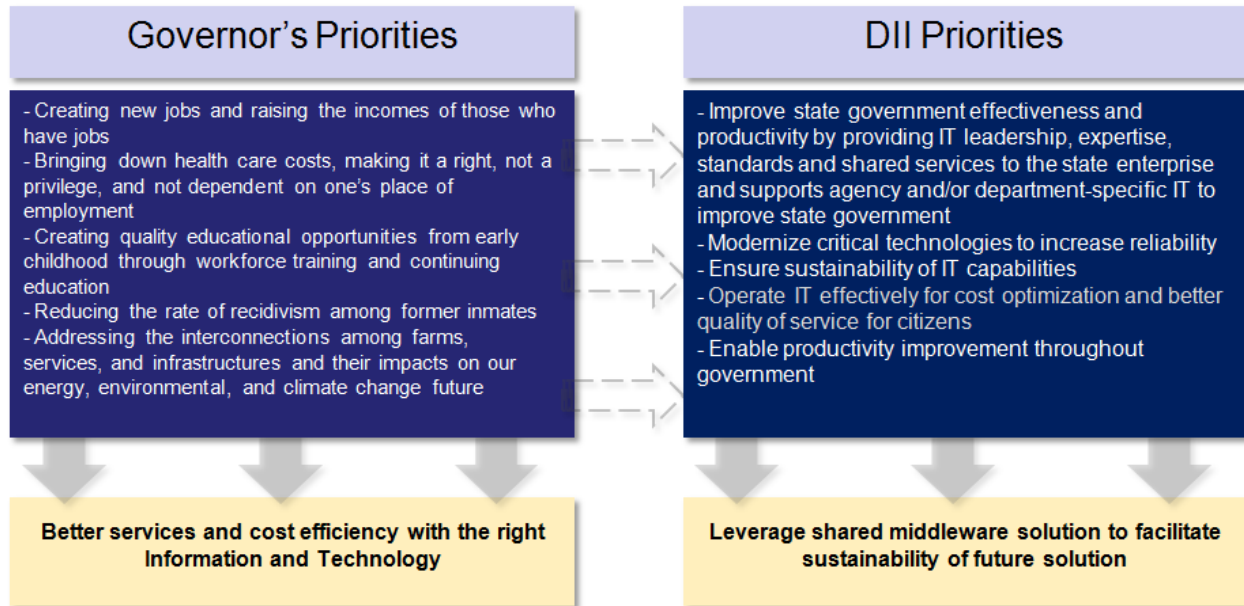
Governor's Priorities

- Creating new jobs and raising the incomes of those who have jobs
- Bringing down health care costs, making it a right, not a privilege, and not dependent on one's place of employment
- Creating quality educational opportunities from early childhood through workforce training and continuing education
- Reducing the rate of recidivism among former inmates
- Addressing the interconnections among farms, services, and infrastructures and their impacts on our energy, environmental, and climate change future

DII Priorities

- Improve state government effectiveness and productivity by providing IT leadership, expertise, standards and shared services to the state enterprise and supports agency and/or department-specific IT to improve state government
- Modernize critical technologies to increase reliability
- Ensure sustainability of IT capabilities
- Operate IT effectively for cost optimization and better quality of service for citizens
- Enable productivity improvement throughout government

Better services and cost efficiency with the right Information and Technology

Leverage shared middleware solution to facilitate sustainability of future solution

Figure 1 Priority Alignment

The Governor's priorities are to offer better services in a cost efficient manner with the right information and technology. DII Enterprise Architects seek to accomplish this by leveraging shared middleware solutions to facilitate sustainable solutions. Applications and services created using SOA standards are able to more easily integrate and adapt to changes within department, agency, and external partner systems.

Figure 2 explains how high-level business strategic vision is enabled by different business capabilities and how those capabilities are aligned with IT Strategy.
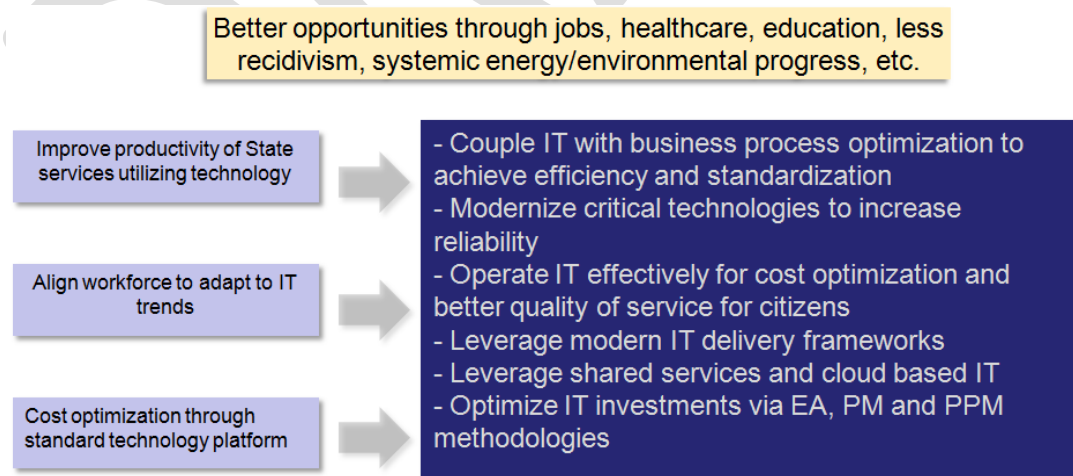
Better opportunities through jobs, healthcare, education, less recidivism, systemic energy/environmental progress, etc.

Improve productivity of State services utilizing technology

Align workforce to adapt to IT trends

Cost optimization through standard technology platform

- Couple IT with business process optimization to achieve efficiency and standardization
- Modernize critical technologies to increase reliability
- Operate IT effectively for cost optimization and better quality of service for citizens
- Leverage modern IT delivery frameworks
- Leverage shared services and cloud based IT
- Optimize IT investments via EA, PM and PPM methodologies

Figure 2 - State of Vermont Business Vision

The strategies and capabilities listed above also point towards the need for SOA based solutions. The modularity of solutions provided through SOA allow for cost effective shared services.

SOA is aligned with the Department of Information and Innovation's Strategic Plan through 2019 by:

- Leveraging successes of others, and learning best practices from outside Vermont

- Leveraging shared services, cloud-based IT, IT economies of scale

- Adapting the Vermont workforce to the evolving needs of state government

- Leveraging modern IT delivery frameworks and enterprise architectures

- Coupling IT with business process optimization, improving overall productivity and customer service

- Optimizing IT investments via standardized Enterprise Architecture methodologies

1.2.1. Shared Service Environment

A shared service environment enables self-service, consolidates systems, and reduces the total cost of ownership. The goal of a shared service environment is to ensure that solutions are sustainable, virtual, secure, and in compliance with the State's standards.

The first step in achieving this is to implement a cloud model. A cloud model efficiently utilizes IT infrastructure; by consolidating IT management and infrastructure, departments will be able to share resources and reduce the overall IT cost.

1.2.2. SOA Interoperability

Currently departments within the State build applications in silos, creating situations that require custom software development to allow for communication between applications. This causes additional development time and application complexity, which can be costly. There is currently no standardization, creating a tangled web of infrastructure and workarounds that becomes increasingly difficult to navigate. Solutions are being developed without reusability in mind and a great deal of existing functionality is being repeatedly redeveloped for newly purchased systems.

SOA solves this by creating Interoperable applications that are standardized and easier to integrate, and require fewer if any workarounds to integrate with other systems. The end effect being an easier to maintain, more stable, and less costly, infrastructure.

1.2.3. Enterprise Architects

Enterprise Architects (EAs) work closely with leadership and business analysts to provide information regarding technology selection, standardization, economies of scale, and help to ensure that the business is able to make informed technology decisions. Furthermore, EAs works to establish and implement governance structures to guide collaborative IT work.

EAs work with all agencies in order to ensure legacy system upgrades leverage common solutions where possible, and that solutions are managed in accordance with industry standards and best practices.

2. SOA COMPONENT STRATEGY

SOA describes an enterprise systems development and integration approach that is both technology agnostic (operating across heterogeneous systems) and aligned with business imperatives; it provides loose coupling of services for effective reuse of enterprise IT assets.

EAs try to leverage SOA solutions when there is real time need for service transactions, or when policy or compliance requires it. Reusable services should be acquired and integrated as directed by business requirements.

Proposed projects should be analyzed by both Enterprise and Business Architects to first determine if services are already in use by the State can fulfill project requirements. Following implementation, new services should be analyzed to determine if they are re-usable, and if they are, add them to the service catalogue for use throughout the enterprise.

Enterprise Architects utilize SOA methodologies to design and assist in the implementation of services that use open standards such as web services, xml messaging, and WS-Security. These services are SOA based and integrate easily with both internal and external systems.

A SOA Governance Board will be established to oversee the SOA environment from an enterprise level. They will consult with the State Chief Technology Officer (CTO) to determine the course and evolution of the SOA environment. The SOA Governance Board will also publish standards for development teams to follow when introducing new services to, or upgrading existing services in, the environment.

2.1.   Enterprise Service Bus

SOA requires an Enterprise Service Bus (ESB) to enable proper and fast communication. By acting as a message broker between service providers and consumers, the ESB allows for loose coupling, enabling services to be independently deployed and heterogeneous. It also enables distributed computing, and promotes agility and flexibility in communication between applications.

The ESB can enable enterprise-wide capabilities, such as Master Data Management (MDM) and Identity and Access Management (IAM). MDM enables the collection and management of critical data from a single point of reference. IAM allows for the management of individuals, their authentication, authorization, and privileges across the enterprise. Both are key parts of SoV's IT strategy going forward into the future.

2.2.   Enterprise Repository

The enterprise repository will store SOA assets, helping the Governance Board perform design time governance over service development teams. This repository will be updated with complete information for each service as those services are onboarded, this includes technical and design documents.